Ross Video Limited

Carbonite

Operation Manual

Video Production Technology

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Important Regulatory and Safety Notices to Service Personnel

Before using this product and any associated equipment, refer to the "**Important Safety Instructions**" listed in the front of your *Setup Manual* to avoid personnel injury and to prevent product damage.

Product may require specific equipment, and/or installation procedures to be carried out to satisfy certain regulatory compliance requirements. Notices have been included in this publication to call attention to these specific requirements.

Symbol Meanings

Protective Earth: *This symbol identifies a Protective Earth (PE) terminal, which is provided for connection of the supply system's protective earth (green or green/yellow) conductor.*

Important: *This symbol on the equipment refers you to important operating and maintenance (servicing) instructions within the Product Manual Documentation. Failure to heed this information may present a major risk of damage or injury to persons or equipment.*

Warning: *The symbol with the word "Warning" within the equipment manual indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.*

Caution: *The symbol with the word "Caution" within the equipment manual indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.*

Warning Hazardous Voltages: *This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product enclosure that may be of sufficient magnitude to constitute a risk of shock to persons.*

ESD Susceptibility: *This symbol is used to alert the user that an electrical or electronic device or assembly is susceptible to damage from an ESD event.*

Important Safety Instructions

1. Read these instructions.

2. Keep these instructions.

3. Heed all warnings.

4. Follow all instructions.

5. Do not use this apparatus near water.

6. Clean only with a dry cloth.

7. Do not block any ventilation openings. Install in accordance with manufacturer's instructions.

8. Do not install near heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11. Only use attachments/accessories specified by the manufacturer.

12. Unplug this apparatus during lightning storms or when unused for long periods of time.

13. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

14. Do not expose this apparatus to dripping or splashing, and ensure that no objects filled with liquids, such as vases, are placed on the apparatus.

15. To completely disconnect this apparatus from the AC Mains, disconnect the power supply cord plug from the AC receptacle.

16. The mains plug of the power supply cord shall remain readily operable.

17. Indoor Use: WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

18. The safe operation of this product requires that a protective earth connection be provided. A grounding conductor in the equipment's supply cord provides this protective earth. To reduce the risk of electrical shock to the operator and service personnel, this ground conductor must be connected to an earthed ground.

19. WARNING: This apparatus, when equipped with multiple power supplies, can generate high leakage currents. To reduce the risk of electric shock, ensure that each individual supply cord is connected to its own separate branch circuit with an earth connection.

20. CAUTION: These service instructions are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

21. Service barriers within this product are intended to protect the operator and service personnel from hazardous voltages. For continued safety, replace all barriers after servicing.

22. Certain parts of this equipment still present a safety hazard with the power switch in the OFF position. To avoid electrical shock, disconnect all A/C power cords from the chassis' rear appliance connectors before servicing.

23. This product contains safety critical parts, which, if incorrectly replaced, may present a risk of fire or electrical shock. Components contained within the product's power supplies and power supply area are not intended to be customer-serviced and should be returned to the factory for repair.

24. To reduce the risk of fire, replacement fuses must be the same type and rating.

25. Use only power cords specified for this product and certified for the country of use.

26. The safe operation of this equipment requires that the user heed and adhere to all installation and servicing instruction contained within the equipment's Engineering Manuals.

27. WARNING: This product includes an “Ethernet Port” which allows this product to be connected to a local area network (LAN). Only connect to networks that remain inside the building. Do not connect to networks that go outside the building.

EMC Notices

United States of America — FCC Part 15

This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Important: *Changes or modifications to this equipment not expressly approved by Ross Video Limited could void the user's authority to operate this equipment.*

Canada

This Class “A” digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe “A” est conforme a la norme NMB-003 du Canada.

Europe

This equipment is in compliance with the essential requirements and other relevant provisions of **CE Directive 93/68/EEC**.

International

This equipment has been tested to **CISPR 22:1997** along with amendments **A1:2000** and **A2:2002**, and found to comply with the limits for a Class A Digital device.

Important: *This is a Class A product. In domestic environments, this product may cause radio interference, in which case the user may have to take adequate measures.*

General Handling Guidelines

- Careful handling, using proper ESD precautions, must be observed.
- Power down the system before PCB removal.

A Word About Static Discharge

Throughout the many procedures in this Engineering Manual, please observe all static discharge precautions.

Caution: *Avoid handling the switcher circuit boards in high static environments such as carpeted areas, and when synthetic fiber clothing is worn. Touch the frame to dissipate static charge before removing boards from the frame, and exercise proper grounding precautions when working on circuit boards. Exercise proper grounding precautions when working on circuit boards.*

Warranty and Repair Policy

Ross Video Limited (Ross) warrants its switchers and related options, to be free from defects under normal use and service for a period of ONE YEAR from the date of shipment. Fader handle assemblies are warranted for the life of the product. If an item becomes defective within the warranty period Ross will repair or replace the defective item, as determined solely by Ross.

Warranty repairs will be conducted at Ross, with all shipping FOB Ross dock. If repairs are conducted at the customer site, reasonable out-of-pocket charges will apply. At the discretion of Ross, and on a temporary loan basis, plug in circuit boards or other replacement parts may be supplied free of charge while defective items undergo repair. Return packing, shipping, and special handling costs are the responsibility of the customer.

Software upgrades for switchers may occur from time to time, and are determined by Ross Video. The upgrades are posted on the Ross Video website, and are free of charge for the life of the switcher.

This warranty is void if products are subjected to misuse, neglect, accident, improper installation or application, or unauthorized modification.

In no event shall Ross Video Limited be liable for direct, indirect, special, incidental, or consequential damages (including loss of profit). Implied warranties, including that of merchantability and fitness for a particular purpose, are expressly limited to the duration of this warranty.

This warranty is TRANSFERABLE to subsequent owners, subject to Ross' notification of change of ownership.

Environmental Information

The equipment that you purchased required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.

To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Ross Video encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

The crossed-out wheeled bin symbol invites you to use these systems.

If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

You can also contact Ross Video for more information on the environmental performances of our products.

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Technical Support

At Ross Video, we take pride in the quality of our products, but if a problem does occur, help is as close as the nearest telephone.

Our 24-Hour Hot Line service ensures you have access to technical expertise around the clock. After-sales service and technical support are provided directly by Ross Video personnel. During business hours (eastern standard time), technical support personnel are available by telephone. Outside of normal business hours and on weekends, a direct emergency technical support phone line is available. If the technical support personnel who is on call does not answer this line immediately, a voice message can be left and the call will be returned shortly. Our Technical support staff are available to react to any problem and to do whatever is necessary to ensure customer satisfaction.

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Features

Thank you for buying a Ross Video Carbonite Series Multi-Definition Live Production Switcher. The Carbonite 1 and Carbonite 2M build on the Ross Video reputation for designing switchers that fit the needs of any production environment.

Custom Controls

This feature brings the power of macros to the switcher operator. A series of button presses can be easily recorded and assigned to any custom control button. Step through complex show openings as easily as pressing Custom Control buttons 1, 2, then 3.

Device Control

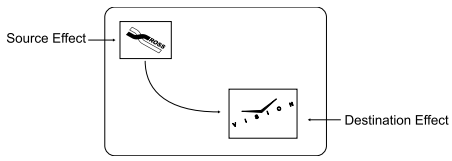
The switcher can control a number of external devices, such as video servers and robotic cameras. For a complete list of supported devices, and information on how to set up and control these devices, visit the Ross Video website (*rossvideo.com/production-switchers/carbonite/interface-list*).

DVE

Four channels of advanced 2D DVE come standard, and can be used for performing over the shoulder, or picture in picture shots. This allows preset pattern keys to be zoomed, cropped, and repositioned horizontally and vertically to create the look you want, or you can use one of the useful pre-built 2D effects to perform 2D background transitions.

Effects Dissolve

The Effects Dissolve feature allows you to interpolate from one memory to another using a memory recall. The switcher will interpolate from the starting memory to the destination memory, creating a smooth, two key frame effect.



Only elements such as clip level and pattern position can be interpolated in the effects dissolve. Other elements, such as crosspoint selection, pattern, and next transition data are recalled first, and then the switcher will slew to the recalled memory.

An effects dissolve can be performed on as many elements and MLEs as required, based on the memory that is being recalled.

General Purpose Interface

Carbonite is equipped with 34 GPI I/Os that can be assigned as either an input or output independently.

The GPI inputs allow the switcher to interface with peripheral equipment such as editors. Each GPI input can be used to perform simple editing and switcher functions such as fade to black or an auto transition.

LiveEDL

Edit Decision Lists are files used by non-linear editing (NLE) suites to aid in post-production. Your switcher can capture EDL data in a file that you load into your NLE suite.

For information on using the LiveEDL feature, visit the Ross Video Website (*rossvideo.com*).

Media-Store

Up to four (4) independent channels of still/animations are available switcher-wide, allowing for thousands of full screen stills and logos that can be cached and used on the switcher.

Animation-Store comes standard with 8 Gigabytes of cache. Channels 1 and 3 have 4 Gigabytes, and channels 2 and 4 have 4 Gigabytes. The number of images cached increases considerably when smaller, non-full screen images like logos are loaded from USB.

MediaWipes

A MediaWipe™ allows you to use an animation from the Media-Store to perform background and key transitions. When the transition starts, the switcher plays the selected animation over top of the background and keys that are being transitioned. A cut is then performed behind the animation to bring up the next shot when the animation ends.

A MediaWipe use Media-Store channels 2 and 4 for the animation and alpha.

UltraChrome

The Ross UltraChrome™ uses advanced video processing technology to provide exceptional blue spill reduction and clean edges, even with difficult source material. Glass, smoke, translucent materials, and natural shadows are handled superbly.

Two floating Chroma Keys are available across both MLEs.

Memory AI Recall Mode

We take the guessing out of memory recalls by ensuring that a memory recall will not affect what is currently on-air. Memory AI uses the content of the memory to configure the Next Transition area and Preview bus for the background and keyers so that the next transition takes the same sources on-air that were on-air in the memory.

Memory System

Storage for 100 complete switcher snapshots per MLE comes standard with all switchers. All of these memories can be stored to a USB media drive, providing custom tailored memories for every operator and every show.

MLE Effect System

The MLE® (Multi-Level Effect) systems are standard. The number of MLEs depends on the chosen switcher model.

Each MLE provides four keyers supporting pattern mask, box mask, self-key, linear key, and UltraChrome™ advanced chroma key for each MLE and is available to each keyer.

MultiUser GUI

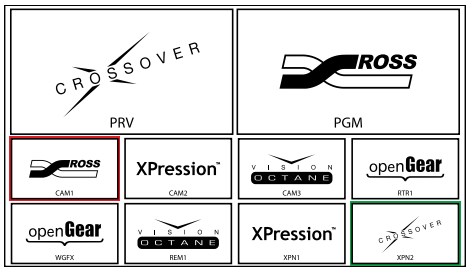
The MultiUser GUI provides a graphical interface to the operation of the switcher from a web browser. The interface consists of a number of windows that allow control over a different part of the switcher and can be moved, positioned, and sized. The position and size of the windows can be stored in an layout, called Perspectives.

MultiViewer

All Carbonite Multi-Definition Live Production Switchers come standard with two broadcast-quality integrated MultiViewers. Each MultiViewer allows you to view up to 16 video sources, in 29 different layouts, from a single output BNC. Any video source on the switcher, including MLE 1 and MLE 2 Program, Preview, and Media-Store channels, can be assigned to any box on the MultiViewer. All boxes on the MultiViewer include mnemonic source names and red and green tallies.

If the switcher is operating in a standard-definition video format, the MultiViewer can be set to output high-definition. In HD output mode, the MultiViewer is only available on specific output BNCs.

Note: *The MultiViewer output is only available in the same video format as the switcher is operating in. For example, if the switcher is operating in 1080i, the MultiViewer output is also 1080i.*



Pattern and Matte/Wash Generators

A single pattern generator dedicated to wipes comes standard, and is equipped with 10 classic wipes. Most wipes can be rotated, bordered, multiplied, aspectized, and repositioned.

Matte/Wash Generator

A matte generator and complex wash generator per MLE, capable of multi-color washes comes standard. Any one of the color generators can be assigned to MATTE, or wipe pattern edges. An additional simple color generator is available for an Aux Bus.

Tally Outputs

The Carbonite Multi-Definition Live Production Switcher has 34 pre-assigned tally relays located in the rack frame. Tallies are fixed to input, and aux sources.

Control Panel Overview

This chapter provides a basic introduction to the Carbonite switcher, including an overview of the different areas on the control panel, using the menu system, as well as an introduction to the various ports, and video buses.

Control Panel Areas

Each Carbonite™ control panel is made up of a number of distinct areas that control different aspects of the switcher. Some of these areas may vary in size or function, depending on the control panel you have.

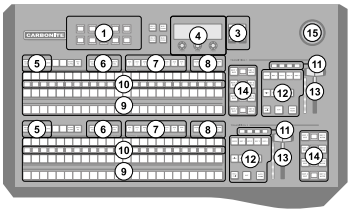


Figure 1: Carbonite 2M Control Panel

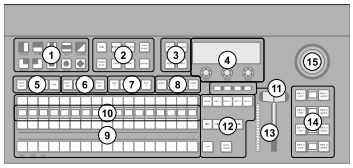


Figure 2: Carbonite 1 Control Panel

1. **Pattern/Menu Selection Buttons** — These buttons are used to select a pattern for a wipe transition, or to access switcher menus. The mnemonic buttons on the Carbonite 2M show the pattern or menu you can select.
2. **Custom Control Command Buttons** — These buttons are used to start, stop, edit, and navigate through custom controls.
3. **Menu Navigation and Memory Control Buttons** — These buttons are used to access switcher menus, move back and forth between menus, and store and recall switcher memories.
4. **Main Display and Selection Knobs** — The three selection knobs are used to adjust and select various menu items or values. The knobs are rotated to choose a value, and pressed to make a selection. The main display shows the menu system of the switcher.
5. **Key Type Buttons** — These buttons are used to choose the type of key you want to use. Use these buttons with the key select buttons to select the keyer, and the type of key you want to use.
6. **Key Select Buttons** — These buttons are used to choose which keyer is selected. The key type buttons and key bus follow the selected keyer.
7. **Aux Bus Select Buttons** — These buttons are used to choose which aux bus is selected. The aux bus follows the selected aux bus.
8. **Custom Control Bank Select Buttons** — These buttons are used to choose which custom control bank is selected. The custom control bus follows the selected custom control bank.
9. **Video Source Buses** — These buses are broken into the Preset, Program, and Key/Aux/Custom Control buses. The Preset bus is the bottom row of source buttons and selects the video source that will be taken on-air with the next background transition. The Program bus is the middle row of source buttons and selects the video source that is currently on-air on the background. The Key/Aux/Custom Control bus is the top row of source buttons and selects the video source that is chosen on the selected keyer or aux bus, or the custom control that is chosen on the selected custom control bank.
10. **Mnemonic Displays** — The mnemonic display shows the name of the source assigned to the source button directly below it. The mnemonic display-name and color for each video source can be adjusted.
11. **On-Air Lights** — These lights glow red to show which keyers are currently on-air.
12. **Transition Area** — These buttons are used to select which video source buses will be included in the next transition and what type of transition will be performed. The Cut and Auto Trans buttons are used to perform transitions.
13. **Manual Transition Fader Bar** — The fader is used to manually control the rate of a transition. What is being transitioned, and the type of transition, are controlled from the Transition Area.
14. **Keyer Transitions Buttons** — These buttons are used to perform cuts or auto transitions on keys directly, without having to include them as part of the next transition.
15. **Positioner** — The positioner is used to control some wipe, border, and wash parameters, as well as some external devices.

Menu System Overview

The menu system is accessed either by pressing **MENU** and the Pattern/Menu Selection button for the menu you want to access, or through an auto-follow for selected functions.

Menu Navigation

The menu system allows you to access all of the setup and configuration information for the Carbonite switcher. In some cases, a menu can be accessed either by pressing the **MENU** button and navigating to the menu, or be double-pressing a button on the control panel.

1. Press **MENU**. The Pattern/Menu Selection buttons light up on the Carbonite 1, and the Pattern/Selection Mnemonics change to the menu names on the Carbonite 2M.
2. Press the Pattern/Menu button for the menu you want to navigate to. The first page of the menu is shown on the display.
3. Press **NEXT** to navigate to the next page of the current menu. If the **NEXT** button is not lit, there are no other pages to the current menu.

Tip: *If you want to return to the first page of a menu, press and hold **NEXT** and press **HOME** (**STORE** on the Carbonite 1). You can also navigate up one level in a menu tree by pressing and holding **NEXT** and pressing **UP** (**RECALL** on the Carbonite 1).*

Auto-Follow Menus

The switcher navigates to auto-follow menus automatically when you select certain functions on the switcher. For example, when you press the **KEY 1 SEL** button, the key adjustment menu is shown on the display.

Auto-Follow functionality also applies to video source buttons that have external devices assigned to them. If you select a source button that an external device is assigned to, the peripheral control menu for that specific device is shown.

Switcher Basics

This chapter gives an overview of how video is controlled by your switcher. This includes video sources, video layering and re-entry, and preview. For information on setting up video inputs, refer to the Setup Guide that came with your switcher.

Video Sources

The switcher has access to two basic types of video sources, external and internal. All video sources can be assigned to video source buttons. By pressing a video source button on a bus, the video source assigned to that button is selected on that bus.

- **External** — External video sources come from cameras, video servers, character generators, or other external devices into the switcher.
- **Internal** — Internal video sources come from internally generated video, such as Media-Stores™, matte color, and black.

To Select a Source on a Bus

To select a video source on a bus, you must identify the MLE and bus you want to assign a video source to, and then press the source button you want to select on that bus.

Tip: *On the Carbonite 1, you must select the **MLE 1** or **MLE 2** button to assign the buses to that MLE.*

- **Program Bus** — Select a source on the PROGRAM bus.
- **Preset Bus** — Select a source on the PRESET bus.
- **Key Bus** — Select a source on a KEY bus.
  - **Key 1** — Press **KEY 1 SEL** to assign the KEY/AUX/CUSTOM CONTROL bus to Key 1 and select a source on the bus.
  - **Key 2** — Press **KEY 2 SEL** to assign the KEY/AUX/CUSTOM CONTROL bus to Key 2 and select a source on the bus.
  - **Key 3** — Press **KEY 3 SEL** to assign the KEY/AUX/CUSTOM CONTROL bus to Key 3 and select a source on the bus.
  - **Key 4** — Press **KEY 4 SEL** to assign the KEY/AUX/CUSTOM CONTROL bus to Key 4 and select a source on the bus.
- **Aux Bus** — Press **AUX #** and press the knob for the Aux Bus you want to select.

  You can also select the Aux Bus directly using the Aux buttons.

Tip: *You can assign special sources to an Aux Bus by pressing and holding the **AUX #** button and pressing the **AUX PGM** (Program), **AUX PV** (Preview), or **AUX CLN** (Clean Feed) source button on the Preset bus. These are the first three buttons on the row.*

For information on assigning video inputs to source buttons, refer to the Setup Guide that came with your switcher.

Video Layering

How video is layered in the output of the switcher depends on how an MLE is re-entered onto the other, and what keyers are on-air for the MLE. If we assume that each MLE has all keyers on-air, and that MLE 1 is re-entered into the MLE 2, the layering will start with MLE 1 Background and progress to MLE 2 Keyer 4.

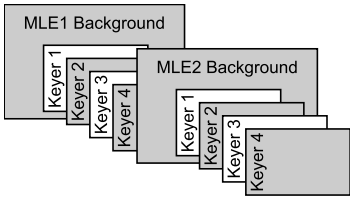


Figure 3: Video Layering

MLE Re-Entry

Re-entry is the term used to describe the process of selecting another MLE on an MLE. For example, if you select MLE 1 on MLE 2, MLE 1 is said to be re-entered onto MLE 2. Re-entry takes the output of an MLE and uses it as the background or key on the other MLE. If you select an MLE on the background bus, the MLE becomes background video source of the other MLE. If you select an MLE on a Key Bus, the MLE becomes the key source of the other MLE.

Keep the following in mind when working with re-entries:

- You cannot re-enter MLE 2 into MLE 1.
- You cannot re-enter an MLE, or the Clean Feed of an MLE, into itself.

To Re-Enter an MLE

1. Set up MLE 2 with a background and a key.

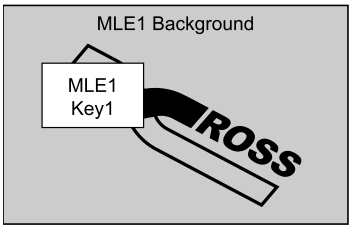


Figure 4: MLE 2

2. Set up MLE 1 with a key.

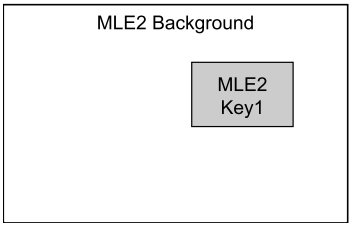


Figure 5: MLE 1

3. Select MLE 1 as a source on the Background Bus of MLE 2. Notice that the output of MLE 1 is now being used as the background of MLE 2.

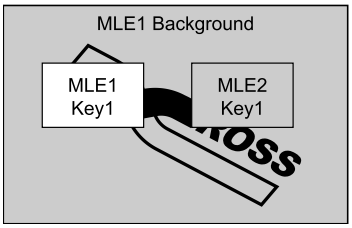


Figure 6: MLE 1 Re-entered onto MLE 2

FlexiClean Clean Feed

FlexiClean™ provides a second Program output that is derived from a different location than the standard program output. A frequent application is the recording of shows for later airing without call-in phone numbers inserted.

The clean feed output can come from before or between the keyers.

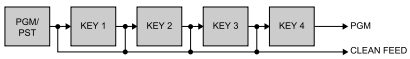


Figure 7: Clean Feed Modes

Video Preview

Video preview allows you to use an additional monitor to preview what the next shot is going to be. The preview for an MLE shows what is selected for the next transition on that MLE. This includes the keys and background video sources that will be on-air after the next transition.

MultiViewer

Each MultiViewer allows you to view up to 16 video sources, in 29 different layouts, from a single output BNC. Any video source on the switcher, including MLE 1 and MLE 2 Program, Preview, and Media-Store channels, can be assigned to any box on the MultiViewer. All boxes on the MultiViewer include mnemonic source names and red and green tallies.

If the switcher is operating in a standard-definition video format, the MultiViewer can be set to output high-definition. In HD output mode, the MultiViewer is only available on specific output BNCs.

Note: *The MultiViewer output is only available in the same video format as the switcher is operating in. For example, if the switcher is operating in 1080i, the MultiViewer output is also 1080i.*

To Turn a MultiViewer On/Off

1. Press **MENU** > **SYSTEM** > **MultiView**.
2. Use the **Output** knob to select the output to use for the MultiViewer.
3. Use the **MView** knob to turn the MultiViewer output On or Off.
4. Use the **Transp** knob to set the transparency for the shadow behind the names on the MultiViewer boxes.
5. Press **NEXT** > **NEXT**.
6. Use the **AncSrc** knob to select which ancillary data source to include with the MultiViewer output.
   - **PV** — Include the ancillary data from the preview output with the MultiViewer output.
   - **PGM** — Include the ancillary data from the program output with the MultiViewer output.

To Assign Sources to a MultiViewer

Any internal or external video source can be assigned to a box on the MultiViewer with source name and tally information. To make it easier to assign sources to a specific box on the MultiViewer, have the MultiViewer output displayed on a monitor as you are setting it up.

1. Press **MENU** > **SYSTEM** > **MultiView** > **NEXT**
2. Use the **Box** knob to select the box on the MultiViewer that you want to assign a video source to.
3. Use the **In/Out** knob to select the source you want to assign to the box.
   - **PGM** — output of the program bus
   - **PV** — output of the preview bus
   - **1-24** — video inputs from input BNCs
   - **M1-4** — Media-Store channels

MultiUser GUI

The MultiUser GUI™ provides a graphical interface to the operation of the Media-Store on the switcher. The position and size of some of the areas in the Media Manager window can be stored in a layout, called Perspectives. The last loaded Perspective is used when the browser is refreshed or opened.

From the Menu Bar at the top of the MultiUser GUI window you can manage Perspectives or log out.

Table 1: Menu Bar Icons

Icon	Name	Description
	Media Manager	Provides a graphic interface to the Media-Store, allowing you to load, play, and eject stills or animations. Only a single Media Manager window can be open.
	Perspectives	Allows you to save, load, and delete perspectives (layouts).
	Logout	Logs out of the current session.

MultiUser GUI Login

To log into and view the MultiUser GUI, you must have a computer connected to the same subnet as the switcher, the IP address of your switcher, and the Google Chrome™ browser installed on your computer.

When you are communicating with the switcher, a moving status indicator is shown in the lower right corner of the browser window. If you lose communications with the switcher, refresh the browser window to reconnect. Refreshing the browser will reset your Perspectives.

Keep the following in mind when logging in and using the MultiUser GUI:

- Ross Video recommends using Google Chrome™ v14.0 running on Windows 7® or Mac® OS X™ Lion to connect to the MultiUser GUI.
- Your browser must have JavaScript and cookies enabled.
- Ross Video recommends that you do not connect more than 5 MultiUser GUI clients to a single switcher at the same time.

To Log Into the MultiUser GUI

Multiple users can be logged into the MultiUser GUI at the same time.

1. On your computer, launch your web browser.
2. In the address bar, type the IP address of your switcher.
   You are prompted for a user name and password.
3. Enter the user name and password for the MultiUser GUI.
   The default User Name is `admin` and Password is `password`.
4. Select **Remember Me** log back into the MultiUser GUI automatically when the web browser is closed and opened again, or the window is refreshed.
5. Press **Login**.

Note: *Click **Logout** in the upper right of the MultiUser GUI window to log out of your current session.*

The Media Manager Window

The Media Manager window provides a graphical interface to the Media-Store. From this window, you can load stills or animations from the internal cache or USB into a Media-Store channel or edit the on-air properties. Media-Store channels have a red background when on-air and green when going on-air with the next transition.

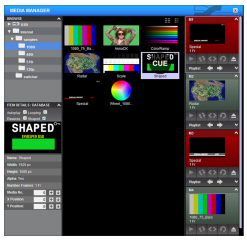


Figure 8: Media Manager Window

Tip: *The film-strip symbol (🎞) on a thumbnail indicates that the media item is an animation, the key symbol (🔑) indicates that the still or animation has an alpha, and the speaker symbol (🔊) indicates that the media item has audio associated with it.*

Stills and animations can be loaded into a channel by either selecting the channel and double-clicking on the file, or by dragging a file and dropping it onto the channel. When a channel or file is selected, the properties for the animation or still can be viewed in the **ITEM DETAILS** area.

Note: *If the files on your USB are new, it takes about 2 seconds per file for the switcher to generate the thumbnail for the MultiUser GUI. Once all the thumbnails are generated, they are displayed in the Media Manager window.*

Animation Controls

The Media Manager interface allows you to manually control the play-out of an animation.

Figure 9: Media-Store Channel — Animation Controls

Table 2: Animation Controls

Icon	Name	Description
	Play	Play the animation loaded in the Media-Store channel.
	Looping	Turns **Looping** of the animation on or off.
	Reverse	Toggle the direction that the animation is played in.
	Auto-Play	Turns **AutoPly** for the animation on or off.
	Eject	Eject the current still or animation from the Media-Store channel. This is the same as loading media number **000** on the panel.

Playlists

Playlists allow you to create a rundown of stills or animations that you want to load into a Media-Store channel. Using the left and right arrows, you can advance to the next or previous still or animation in the playlist.

Note: *Items on the playlist are not pre-cached. As you advance to the next item in the list, the switcher must load that still or animation. Depending on what you are loading, and if the item has been loaded before, this could take a few seconds.*

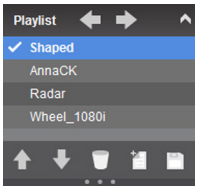


Figure 10: Playlist

Table 3: Playlist Controls

Icon	Name	Description
	Previous	Advance to the previous item in the playlist. The item in the playlist that is being shown on the Media-Store channel indicated with a check-mark. The playlist does not loop back to the top when it reaches the last item.
	Next	Advance to the next item in the playlist.
	Up and Down	Move the currently selected item up in the playlist.
	Up and Down	Move the currently selected item down in the playlist.
	Delete	Delete the selected item from the playlist. This does not delete the item, or clear the Media-Store channel.
	New Playlist	Clears the current playlist.
	Load or Save Playlist	Allows you to load, save, or delete a playlist on the switcher. If you delete a playlist that was loaded into a Media-Store channel, it does not clear that channel.
	Expand or Collapse	Expand or Collapse the playlist area for the Media-Store channel.

Transitions

Transitions are used to change the background video and take keys on and off-air. A transition can include any combinations of background and keyers for an MLE. The background and each keyer can be transitioned independently and at the same time using the dedicated **KEY CUT** and **KEY AUTO** buttons.

Performing Transitions

What you can include in the transition, and the type of transition you can perform, depend on the number of media resources you have, and if you are performing a background and keyer transition at the same time.

Keep the following in mind when performing transitions:

- If any of the sources going on-air have an assigned GPI output, the GPI output is triggered and the switcher then waits the configured pre delay interval before performing the transition. If you perform a transition with the fader handle, the GPI output is triggered but the pre delay interval is ignored.
- If any of the sources going on-air are assigned to a video server, you can have the video server play when the source is taken on-air by using the **RIClip** knob to select **On**.
- If any of the sources going on-air are assigned to a video server, the switcher waits for the configured pre delay interval before performing the transition. If you perform a transition with the fader handle, the pre delay interval is ignored.
- If the fader is moved during an auto transition, control of the transition is passed to the fader. You must complete the transition with the fader. This allows you to override any auto transition in progress with the fader.
- A key only transition can be performed by pressing the **KEY CUT** or **KEY AUTO** button for the key you want to transition.
- You can pause an auto transition by pressing the **AUTO TRANS** button during the transition. Press the button again to continue the transition.

Understanding the Transition Menu

When you select a transition type button, the menu system displays a number of options that allow you to adjust how a transition is performed or appears. The options that are available depend on the type of transition that is selected.

Table 4: Transition Menu Items

Menu Item	Description
Time	selects the amount of time (Transition Rate), in frames, that an auto transition takes
RIClip	selects whether GPI outputs assigned to input sources are triggered before a transition
Dirctn	selects the direction that the wipe is performed (forward or reverse), as well as turns the Flip-Flop feature on or off
Key #	selects the amount of time, in frames, that an auto transition dissolve for the keyer takes
Pattrn	selects the pattern for the wipe transition
X Pos	selects the horizontal position for the wipe pattern
Y Pos	selects the vertical position for the wipe pattern
Aspect	selects the aspect ratio for the wipe pattern
Border	turns the border feature on and selects the size of the border on the wipe pattern
Soft	selects the amount of softness that is applied to the wipe border
Load	selects the color for the wipe border from a pre-set list
BHue	adjusts the hue of the wipe border color
BSat	adjusts the saturation of the wipe border color
BLum	adjusts the luminance of the wipe border color
Rot	selects the rotation for the wipe pattern
HMult	multiplies the wipe pattern horizontally (1-32)
VMult	multiplies the wipe pattern vertically (1-32)
Browse	selects an animation for a media transition
Attrib	used with the **Value** knob to adjust parameters for the MediaWipe (*Media-Store Attributes* on page 41)
Func	selects how the **Attrib** adjustments are saved
Limit	turns the Transition Limit feature on or off
Effect	selects the pattern for the DVE transition

To Perform a Transition

All transitions, with the exception of cuts on the background or key bus, have the same basic setup. To perform a transition, you must select what sources you want to transition on what buses, and how you want the transition to appear.

1. In the Transition Area, select the elements (**BKGD KEY 1 KEY 2 KEY 3 KEY 4**) you want to include in the next transition. To select multiple keys and background, press and hold the first element, and select the additional elements.
2. Select the video sources you want to take on-air on the program and key buses.

3. Select the type of transition (**DISS WIPE DVE MEDIA**) you want to perform.
4. Use the **RIClip** knob if you want any video servers clips assigned to a source being taken on-air to play with the transition (**On**).
5. Perform the transition.
   - **Auto Transition** — Press **AUTO TRANS**. The transition is performed at the set transition rate.
   - **Cut** — Press **CUT**.
   - **Fader** — Move the fader from one limit to the other. The rate at which you push the fader determines the rate of the transition.

   If a pre-delay has been set, the switcher will apply the pre-delay interval before performing the transition.

To Override the Pre-Delay Setting

During the pre-delay time, you can override the pre-delay count and cut the sources on-air immediately.

- While the switcher is waiting for the pre-delay countdown to complete, perform one of the following
  - Press the source button on the background bus that is going-on air. The pre-delay countdown and the transition are aborted and the source is cut to air on the background bus.
  - Initiate a transition with the fader handle. The pre-delay countdown is aborted and the transition proceeds as you move the fader handle.

To Abort a Transition During the Pre-Delay

During the pre-delay time, you can abort the transition completely.

- While the switcher is waiting for the pre-delay countdown to complete, perform one of the following
  - Press any source button on any bus other than the source button on the background bus that is going-on air.
  - Press the **BKGD** or **Key #** button in the next transition area.
  - Press the **CUT** or **AUTO TRANS** button.
  - If a key is included in the transition, press one of the dedicated key transition button.
  - Recall a memory. The pre-delay countdown and transition are aborted and the memory register is recalled.

Cut Transitions

A Cut is an instantaneous transition between video sources. Unlike all the other transition types, there are no intermediate steps between the video source that is on-air, and the video source you are transitioning to.

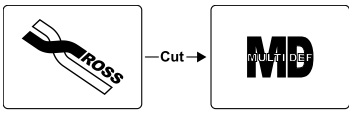


Figure 11: Example Cut Transition

A cut is performed either by selecting difference sources on a background or key bus, or by pressing a **CUT** button.

Dissolve Transitions

A Dissolve is a gradual fade between video sources. For a Background transition, the video signal on the Background bus and the video signal on the Preset bus are mixed together until the Preset bus video signal completely replaces the Background bus video signal.

Figure 12: Example Dissolve Transition

To Set Up a Dissolve

A dissolve transition requires that you set a background and key transition rate for the auto transition. A fader transition does not use the transition rate.

1. Press **DISS**.
2. Use the **Time** knob to set the length of the background transition.

   You can also select a time by pressing one of the **5** through **60** buttons.
3. Press **NEXT**.
4. Use the **Key #** knobs to select the length of the key transitions.

Wipe Transitions

A Wipe is a gradual transition where one video signal is replaced with another according to a wipe pattern. In the example below, a line wipe is being used.

Figure 13: Wipe Transition

For Key transitions, the key is wiped on or off-air with the transition and the background remains untouched. The duration of a wipe transition depends on either the

transition rate for the MLE, or the rate at which the fader is moved.

To Set Up a Wipe

A wipe transition requires that you select a wipe pattern, set the direction and number/size of wipe pattern, as well as set a background and key transition rate for the auto transition. A fader transition does not use the transition rate.

1. Press **WIPE**.
2. Use the **Time** knob to set the length of the background transition.
3. Use the **Dirctn** knob to select the direction that the wipe travels.
4. Press the **Dirctn** knob to toggle Flip-Flip on. With Flip-Flop on **FF**, the wipe runs forward during the first transition and then reverse during the second.
5. Press **NEXT**.
6. Use the **Pattrn** knob to select the wipe pattern you want to use. You can also select the pattern by pressing the pattern button directly.
7. Use the **X Pos** knob to position the wipe pattern horizontally. You can also use the positioner.
8. Use the **Y Pos** knob to position the wipe pattern vertically. You can also use the positioner.
9. Press **NEXT**.
10. Use the **Aspect** knob to adjust the aspect ratio of the pattern. Not all patterns can be adjusted.
11. Use the **Border** knob apply a border to the wipe. Refer to the section *To Apply a Border to a Pattern* on page 18 for information on borders.
12. Press **NEXT**. If a border is applied to the wipe, you must press **NEXT** multiple times to get to the next step.
13. Use the **Rot** knob to rotate the pattern. Not all patterns can be rotated.
14. Use the **HMult** knob to multiply the pattern horizontally.
15. Use the **VMult** knob to multiply the pattern vertically.

To Apply a Border to a Pattern

1. Press **WIPE** > **NEXT** > **NEXT**
2. Use the **Border** knob to adjust the size of the border around the pattern.
3. Use the **Soft** knob to adjust the softness of the pattern border.
4. Press **NEXT**.
5. Select a color for the border.
   - Use the **Load** knob to select a preset color for the border.
   - Press **NEXT** and use the **BHue**, **BSat**, and **BLum** knobs to select your own color.

DVE Transitions

A DVE transition is a gradual transition where one video signal is replaced with another according to a 2D DVE pattern.

Keep the following in mind when performing DVE transitions:

- You must include the background when performing a DVE transition on a Chroma Key, Self Key, or Auto-Select Key. If you do not include the background, a dissolve transition is performed.
- Performing a DVE transition on a DVE Key without including the background scales the transition effect to the size of the DVE Key. This transition does not consume an additional DVE resource.
- Performing a DVE transition on a DVE Key with the background included does not scale the transition effect. This transition consumes the second DVE resource.

To Set Up a DVE Transition

A DVE transition requires that you select the DVE pattern and duration for the transition.

1. Press **DVE**.
2. Use the **Time** knob to set the length of the background transition.
3. Use the **Dirctn** knob to select the direction that the wipe travels.
4. Press **NEXT**.
5. Use the **Effect** knob to select the DVE pattern you want to use. You can also select the most of the patterns by pressing, or double-pressing, the pattern button directly.
   - **PushL** — Push Left (◧)
   - **PushR** — Push Right (double-press ◧)
   - **PushU** — Push Up (⬒)
   - **PushD** — Push Down (double-press ⬒)

- **SqzHor** — Squeeze Horizontally (▮)
- **SqzVert** — Squeeze Vertically (double-press ▮)
- **SqzCtr** — Squeeze to the Center (▣)
- **PushUL** — Push to Upper-Left (◩)
- **PushUR** — Push to Upper-Right (double-press ▮)
- **PushDL** — Push to Lower-Left (double-press ▬)
- **PushDR** — Push to Lower-Right (double-press ◩)
- **SqzUR** — Squeeze to Upper-Right (▛)
- **SqzUL** — Squeeze to Upper-Left (▛)
- **SqzDR** — Squeeze to Lower-Right (double-press ▛)
- **SqzDL** — Squeeze to Lower-Right (double-press ▛)
- **CirclL** — Circle Left (◉)
- **CirclR** — Circle Right (double-press ◉)
- **FlyTru** — Fly Through (double-press ▣)
- **Strtch** — Stretch Horizontally to Black (◈)
- **Tumble** — Tumble Down (double-press ◈)
- **1000lb** — Falls and then Bounces
- **SqzU** — Squeeze Up
- **SqzD** — Squeeze Down
- **SqzL** — Squeeze Left
- **SqzR** — Squeeze Right

MediaWipe Transitions

A MediaWipe™ allows you to use an animation to cover a transition. When the transition starts, the switcher plays the selected animation over top of the background and keys that are being transitioned. When the cut point is reached, the switcher performs a cut transition.

It is important to use a full-screen image in the animation at the cut point so that the cut is not visible on-air.

Keep the following in mind when performing MediaWipes:

- Although you can select a still image for a media transition, it is not recommended.
- Only Auto Transition should be used for Media transitions. Using the fader to perform the transition manually could result in jumps in the animation.
- The duration of the transition (Time) is set by the length of the animation and the play speed of the animation.

To Set Up a MediaWipe

A MediaWipe™ requires that you select the animation you want to use. How the animation plays and appears during the transition is stored in the animation. Refer to *Media-Store* on page 39 for information animations.

1. Press **MEDIA**.
2. Press **NEXT**.
3. Press the **Browse** knob.
4. Use the **Browse** knob select the location where the animation is stored. You can also load an animation by entering the media number using the pattern buttons.
   - **Internal(0)** — Internal cache (flash memory containing sample images only)
   - **USB(1)** — USB drive installed in the frame
5. Press the left knob.
6. Use the left knob to select the animation you want to use for the transition.
7. If you have not set a cut frame for the animation, use the fader to move through the animation to the point where you want the video behind the animation to cut to the new video source.
8. Press and hold the **MEDIA** button and press **CUT** to set the new cut frame.

Transition Limits

The Transition Limit allows you to set the point in a transition where an auto transition stops. When active, the point in the transition where the auto transition will stop is indicated by a flashing segment on the transition progress bar next to the fader handle. The auto transition proceeds to this point and stops. The second auto transition starts from the transition limit point and either goes back to where the first transition started.

Tip: *If you turn Limit off when the transition has stopped at the transition limit point, the next transition starts from the transition limit point and goes forward to complete the transition, instead of going back to the start.*

To Set Up a Transition Limit

A transition limit is set using the fader of the MLE that you want to set up the transition limit on. The transition limit is specific to the MLE it is set on.

1. Set up the transition you want to perform.
2. Press **NEXT** until **Limit** is shown on the menu.

3. Move the fader to the position in the transition where you want to set the transition limit point.
4. Toggle the **Limit** knob (**On**) to set the transition limit point.
   The segment on the transition progress bar next to the fader handle flashes, indicating the location of the transition limit point.

The transition limit is set and active for the MLE you set it on. You can turn transition limit on and off by toggling the **Limit** knob while the fader is at either the top or bottom limit. If the fader is not on a limit when you toggle the transition limit on, a new transition limit will be set. Double-press the **Limit** knob to reset the transition limit point.

GPI Output Triggers

Each video source can have a GPI output assigned to it. This GPI can be used to trigger an external device, such as a video server, to play the cued clip when the video sources from the video server are taken on-air. This trigger can be set up to occur automatically any time the video source is transitioned on-air, or it can be triggered manually.

An automatic GPI output trigger can be overridden if required.

Note: *The Next Button Secondary Function must be set to GPO to be able to trigger a GPI output manually using the NEXT button.*

Keep the following in mind when working with GPI output triggers:

- The **RlClip** knob must be set to **On** to trigger a GPI output with a transition.
- Edge triggered GPI outputs remain triggered for the configured duration.
- Level triggered GPI outputs toggle between high and low each time they are triggered.

To Manually Trigger a GPI Output

The GPI must already be set up as a output and the Next button functionality must be set to GPO before you can manually trigger it.

1. Press and hold the **NEXT** button.
   While holding the Next button, the mnemonic/pattern buttons light for each GPI output that is currently triggered.
2. Press the mnemonic/pattern button for the GPI output you want to trigger. The number of the GPI is shown on the mnemonics of the buttons.
   The numbers on the pattern buttons on the Carbonite 1 correspond to the GPI.

To Override a GPI Output

The RlClip personality option must be set to User for you to override GPI output triggering.

1. Prepare the transition as required, but do not perform the transition.
2. Press the transition type button again to bring up the transition menus.
3. Use the **RlClip** knob to select whether the GPI output is triggered (**On**), or is not triggered (**Off**).

Patterns, Washes, and Mattes

Patterns, Washes, and Mattes are internally generated graphical elements that can be used for key or background fill, key shapes, and transition effects. The switcher has a limited number of pattern and matte generators dedicated to each MLE.

Patterns

Pattern generators are used for wipes, masks, and washes. Each pattern generator can create a single pattern output that can be adjusted to create a specific look.

Patterns can be applied to the following:

- **Wipes** — Press **WIPE**.
- **Masks** — Select the key you want apply the mask to and use the **Mask** knob to select **Pattern**.
- **Washes** — Select the matte generator (**BG**) on a background or key bus and use the **Wash** knob to select **On**.

To Set Up a Pattern

When a pattern generator is assigned to a wipe, mask, or wash, the pattern setting are displayed. Selecting the **WIPE** button, **KEY SEL** button, or the matte generator (**BG**) returns to this menu. When a pattern generator is assigned the pattern settings are part of the setup menu.

1. Use the **Pattrn** knob to select the wipe pattern you want to use. You can also select the pattern by pressing the pattern button directly.
2. Use the **X Pos** knob to position the wipe pattern horizontally. You can also use the positioner.
3. Use the **Y Pos** knob to position the wipe pattern vertically. You can also use the positioner.
4. Press **NEXT**.
5. Use the **Aspect** knob to adjust the aspect ratio of the patten. Not all patterns can be adjusted.
6. Use the **Border** knob to apply a border to the wipe.
7. Press **NEXT**. If a border is applied to the wipe or mask, you must press **NEXT** multiple times to get to the next step.
8. Use the **Rot** knob to adjust the aspect ratio of the patten. Not all patterns can be rotated.
9. Use the **HMult** knob to multiply the pattern horizontally.
10. Use the **VMult** knob to multiply the pattern vertically.

Washes

Washes are applied to matte generators selected on the background or key buses and allow you to apply a two-color affect based on a selected pattern.

To Set Up a Wash

A wash applies colors to a pattern selected for a matte. The first color is preset to the matte color, but both are selectable. Selecting the source button again, or KEY SEL button returns to this menu. Refer to the sections on mattes and patterns for information on setting them up. You can load a preset color instead of creating the first custom color.

1. Use the **Hue 1** knob to adjust the hue of the first custom color.
2. Use the **Sat 1** knob to adjust the saturation of the first custom color.
3. Use the **Lum 1** knob to adjust the luminance of the first custom color.
4. Press **NEXT**.
5. Use the **Wash** knob to select **On**.
6. Press **NEXT**.
7. Use the **Size** knob to select the size of the wash pattern.
8. Press **NEXT** > **NEXT** > **NEXT** > **NEXT**.
9. Use the **Hue 2** knob to adjust the hue of the second custom color.
10. Use the **Sat 2** knob to adjust the saturation of the second custom color.
11. Use the **Lum 2** knob to adjust the luminance of the second custom color.

Mattes

Mattes are solid color signals that can be applied to backgrounds and keys, and borders. Color selection is done either by picking a preset color, or by adjusted hue, saturation, and luminance to create a custom color.

Mattes can be applied to the following:

- **Background** — Select the matte generator (**BG**) on a background or key bus. The full region of the background or key is filled with the selected color.
- **Border** — Assign a border to a **WIPE** transition or a key. The wipe border is filled with the selected color.

To Set Up a Matte Color

When a matte generator is assigned to a background or key, the matte setting are displayed. Selecting the source button again, or **KEY SEL** button returns to this menu. When a matte generator is assigned to a key border or wipe border, the matte settings is part of the setup menu, and become active when **Border** is set to greater than 0.

1. Press **NEXT**.
2. Use the **Load** knob to select the preset color you want to use.
3. Press the **Load** knob to load the selected color. If you want to use the preset color, ignore the rest of this procedure.
4. Press **NEXT**.
5. Use the **Hue** knob to adjust the hue of your custom color.
6. Use the **Sat** knob to adjust the saturation of your custom color.
7. Use the **Lum** knob to adjust the luminance of your custom color.

Keying

Keying is the term used to describe when you insert (or electronically cut) portions of one scene into another, or place titles over background images. Keys are made up of two basic components, an alpha, that cuts the hole in the background video, and a fill, that fills the hole with different video.

Keys, like MLEs, are layered onto the background video signal from the lowest numbered key to the highest on an MLE.

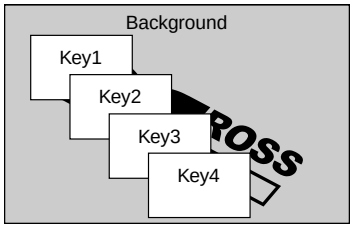


Figure 14: Key Priority

Understanding the Keying Menu

When you select a key type button (), the menu system displays a number of options that allow you to adjust how a the key appears. The options that are available depend on the type of key that is selected.

The switcher supports Self, Auto Select, Chroma, and DVE keys in each MLE.

Table 5: Keying Menu Items

Menu Item	Description
Clip	removes lower-saturated colors from the video image
Gain	adjusts the transition between video image, and the parts of the video image that are removed
Transp	adjusts the overall transparency of the key video
Linear	sets the clip, gain, and transparency values for self keys back to the default
Invert	reverses the polarity of the key alpha so that the holes in the background are cut by dark areas of the key alpha instead of bright areas
Mask	selects the type of mask that is applied to the key (*Masks* on page 30)
M-Frce	turns the force mask feature on or off (*To Pattern Mask a Key* on page 30)
M-Inv	turns the invert mask feature on or off (*To Pattern Mask a Key* on page 30)
Size	adjusts the size of the mask or DVE key
Pattrn	selects the pattern for the pattern mask
X Pos	selects the horizontal position of the mask or DVE key
Y Pos	selects the vertical position of the mask or DVE key
Aspect	selects the aspect ratio for the mask pattern or DVE key
Border	turns the border feature on and selects the size of the border on the mask pattern or DVE key
Soft	selects the amount of softness that is applied to the mask or DVE key border
Load	selects the color for the border from a pre-set list
BHue	adjusts the hue of the border color
BSat	adjusts the saturation of the border color
BLum	adjusts the luminance of the border color
Rot	selects the rotation for the mask pattern
HMult	multiplies the mask pattern horizontally (1-32)
VMult	multiplies the mask pattern vertically (1-32)
HCrop	press to toggle between **HCrop**, **Left/R**, and **L/Rght** • **HCrop** — adjusts the horizontal cropping of the DVE key • **Left/R** — adjusts the cropping of the left side of the DVE key • **L/Rght** — adjusts the cropping of the right side of the DVE key
VCrop	adjusts the vertical cropping of the DVE key • **Top/B** — adjusts the cropping of the top of the DVE key • **T/Bttm** — adjusts the cropping of the bottom of the DVE key
Left/R	press to toggle between **Left/R** and **L/Rght** • **Left/R** — adjusts the cropping of the left side of the box mask • **L/Rght** — adjusts the cropping of the right side of the box mask
Top/B	press to toggle between **Top/B** and **T/Bttm** • **Top/B** — adjusts the cropping of the top of the box mask • **T/Bttm** — adjusts the cropping of the bottom of the box mask

Self Keys

A Self Key is a key in which the luminance, or brightness, values of the key source are used as the alpha for the key.

To Set up a Self Key

A self key is set up by selecting the keyer and video source you want to use, and adjusting the key parameters.

Tip: *You can return the clip and gain values to the default settings by pressing the* ***Make Linear*** *knob.*

1. Select the keyer that you want to set up a Self Key on.

2. Select the video signal, on the key bus, that you want to use for the key.
3. Press **SELF KEY**.
4. Use the **Clip** knob to remove lower-saturated colors from the video image.
5. Use the **Gain** knob to adjust the transition between video image, and the parts of the video image that are removed.
6. Use the **Transp** knob to adjust the transparency of the key from opaque (**0%**) to fully transparent (**100%**).
7. Press **NEXT**.
8. Use the **Invert** knob to reverse the polarity of the key alpha (**On**) so that the holes in the background are cut by dark areas of the key alpha instead of bright areas.
9. Press **NEXT**.
10. Use the **Mask** knob to apply a mask to the key.

Auto Select Keys

An Auto Select Key is a key in which two video signals are required to make the key. The Alpha is used to cut the hole in the video and the fill is used to fill the hole. These signals often originate from external devices such as character generators, external still stores, or other graphics systems.

To Set Up an Auto Select Key

An auto select key is set up by selecting the keyer and video source you want to use, and adjusting the key parameters. The pairing of the video and alpha video signals is done when configuring video inputs. Refer to the Setup Guide that came with your switcher for information on setting up Auto Keys.

Tip: *You can return the clip and gain values to the default settings by pressing the **Make Linear** knob.*

1. Select the keyer that you want to set up an Auto Select Key on.
2. Select the video signal on the key bus that you want to use for the key.
3. Press **AUTO SELECT**.
4. Use the **Clip** knob to remove lower-saturated colors from the video image.
5. Use the **Gain** knob to adjust the transition between video image, and the parts of the video image that are removed.
6. Use the **Transp** knob to adjust the transparency of the key from opaque (**0%**) to fully transparent (**100%**).
7. Press **NEXT**.
8. Use the **Invert** knob to reverse the polarity of the key alpha (**On**) so that the holes in the background are cut by dark areas of the key alpha instead of bright areas.
9. Press **NEXT**.
10. Use the **Mask** knob to apply a mask to the key.

The Auto Select key uses the pre-assigned Auto Key association to select the proper video and alpha. If you want to temporarily select a different video source for the alpha, press and hold the **AUTO SELECT** button and select the video source you want to use as the new fill.

UltraChrome Chroma Key

An UltraChrome™ Chroma Key is a key in which the hole is cut based on a color value, or hue, rather than a luminance value or alpha signal. The color is removed and replaced with background video from another source. The default color is blue.

Chroma Key adjustments are persistent and are not affected by a soft reset or switcher reboot. However, initializing the Chroma Key or performing a factory reset returns all adjustments to default values.

Chroma Key Modes

The UltraChrome Chroma Key operates in one of two modes, Basic or Advanced, depending on the complexity of the Chroma Key you are setting up.

- **Basic Mode** — In basic mode, UltraChrome provides a simple background/foreground chroma key with adjustment for background spill and edge softness.
- **Advanced Mode** — In advanced mode, UltraChrome provides advanced background shadow and translucency control, as well as control over background/foreground transition areas.

Although it is possible to switch back and forth between advanced and basic mode, the additional image correction of the advanced mode is only applied in the advanced mode. For example, if you use the basic mode to set up the Chroma Key and then switch to the advanced mode, the entire image may change as the image correctors provided by the advanced mode are applied at their default settings.

Chroma Key Basic Mode

The following chroma key parameters can be adjusted in Basic Mode:

- **Background Area** — Allows you to modify the range of colors that are considered background and are masked out of the Chroma Key.
- **Edge** — Allows you to adjust the amount of edge softening applied to the foreground. This helps blend the foreground into the new background.
- **Foreground Area** — Allows you to modify the range of colors that are considered foreground and are not masked.
- **Luminance** — Allows you to adjust the overall brightness of the shadow, translucent, and foreground-background transition area to improve the Chroma Key appearance.
- **Shadow** — Allows you to adjust the amount of shadow extraction from the background. This is the actual shadow that the foreground subject is casting onto the screen.
- **Spill** — Allows you to remove background color casts that may spill into the foreground image (green color cast on the foreground from a green-screen for example).
- **Foreground - Background Transition Gain** — Allows you to adjust the transparency of the foreground - background transition area. This helps blend the foreground into the new background.
- **Translucency** — Allows you to adjust the size and transparency of translucent, or semi-transparent, areas.

To Set Up a Chroma Key in Basic Mode

The UltraChrome chroma key tries to automatically adjust for the scene you are trying to chroma key. For the best results, initialize the key first, and then identify the areas where you need to adjust the key.

1. Select the keyer that you want to set up a basic Chroma Key on.
2. Select the video signal on the key bus that you want to use for the key.
3. Press **CHR KEY**.
4. Use the **Mode** knob to select **Basic**.
5. Use the **Color** knob to select the color you want to key out.
6. Press the **Init** knob to initialize the chroma key. Every time the **Init** knob is pressed, the switcher resets all the Chroma Key parameters to their default settings.
7. Press **NEXT**.
8. Adjust the Background as follows:
   a) Use the **Type** knob to select **Bkgd**.
   b) Use the **Value** knob to adjust the background gain.
      - Increasing the Gain value causes the background to appear more opaque. This results in less of the background color being removed.
      - Decreasing the Gain value causes the background to appear more transparent. This results in more of the background color being removed.
9. Adjust the edges of the foreground as follows:
   a) Use the **Type** knob to select **Edge**.
   b) Use the **Value** knob to add or remove edge softening of the foreground image and alpha channel.
      - Increasing the Softness value increases the amount of softness applied to the foreground edges and alpha channel.
      - Decreasing the Softness value decreases the amount of softness applied to the foreground edges and alpha channel.
10. Adjust the Foreground colors, or hues, as follows:
    a) Use the **Type** knob to select **Foregd**.
    b) Use the **Cntrl** knob to select **Clip**.
    c) Use the **Value** knob to adjust the foreground clipping.
       - Increasing the Clip value removes lower-saturated colors from the foreground image.
       - Decreasing the Clip value includes lower-saturated colors in the foreground image.
    a) Use the **Cntrl** knob to select **Hue**.
    b) Use the **Value** knob to select the central, or base, color for the foreground.
       - Increasing the Hue value moves counter-clockwise around the color wheel to select a base color.

- Decreasing the Hue value moves clockwise around the color wheel to select a base color.

a) Use the **Cntrl** knob to select **Reject**.

b) Use the **Value** knob to include or reject hues adjacent to the base color.

- Increasing the Reject value decreases the amount of adjacent hues that are included in the foreground.
- Decreasing the Reject value increases the amount of adjacent hues that are included in the foreground.

11. Adjust the amount of background color that is spilling over into the foreground as follows (green color cast on the foreground from a green screen for example):

a) Use the **Type** knob to select **Spill**.

b) Use the **Value** knob to remove any color cast onto the foreground.

- Increasing the Range value causes more of the foreground colors to be corrected for background color spill.
- Decreasing the Range value causes fewer of the foreground colors to be corrected for background color spill.

12. Press **NEXT**.

13. Use the **Mask** knob to apply a mask to the key.

Chroma Key Advanced Mode

An UltraChrome chroma key, in advanced mode, breaks the image into five elements which determine, or partially determine, which part of the image is keyed out, or removed.

- **Background** — Background elements are those pixels in the source video that are the same color as the one you chose to key out. Note that the Shadow and translucent areas (see below) are completely contained within the Background area.
- **Shadow** — Shadow elements are those pixels in the source video with colors that are within the Background range, but with lower luminance values, depending on the shadow range. You modify the Shadow range to cover darker areas of the background (e.g. where the foreground is casting a shadow on the background screen).
- **Translucency** — Translucent elements are those pixels in the source video that are in the Background range, but with higher luminance values than the Shadow range. You can control the upper-end of the Translucency range by setting a wider hue-range to constrain the area. You can also control the transparency of the Translucent area.
- **Transition** — Transition elements are those pixels in the source video with colors that are not within any of the previous three ranges and are also not considered part of the Foreground area. These are typically the pixels near the edge of the foreground, where it blends into the background.
- **Foreground** — Foreground elements are those pixels that are not within the Background, Shadow, Translucency, or Transition ranges. This is the area with colors that will not be keyed out and will remain solid.

The remaining three adjustments that can be made to an Advanced UltraChrome chroma key allow you to adjust spill suppression, edge softness and luminance.

- **Spill Suppress** — Spill Suppression elements are those pixels in the Foreground that have a noticeable tint of the Background color. This typically occurs around the edge of the foreground subject as glow from the background blue-screen or green-screen “spills” onto them.
- **Edge Softness** — Edge Softness lets you apply varying degrees of softening to the Foreground edges to help it blend in with the underlying background image that it is being keyed over.
- **Luminance** — Luminance allows you to control the overall brightness of Shadow, Translucency, and Transition areas as well as partial reflections to more closely match the Foreground brightness.

To Set Up a Chroma Key in Advanced Mode

The UltraChrome chroma key tries to automatically adjust for the scene you are trying to chroma key. For the best results, initialize the key first, and then identify the areas where you need to adjust the key.

1. Select the keyer that you want to set up a basic Chroma Key.
2. Select the video signal on the key bus that you want to use for the key.
3. Press **CHR KEY**.
4. Use the **Mode** knob to select **Adv**.
5. Use the **Color** knob to select the color you want to key out.
6. Press the **Init** knob to initialize the chroma key. Every time the **Init** knob is pressed, the switcher

resets all the Chroma Key parameters to their default settings.

7. Press **NEXT**.
8. Adjust the Background as follows:
   a) Use the **Type** knob to select **Bkgd**.
   b) Use the **Cntrl** knob to select **NegHue**.
   c) Use the **Value** knob to adjust the range of hues that are included in the Background, expanding counter-clockwise around the color wheel.
   a) Use the **Cntrl** knob to select **PosHue**.
   b) Use the **Value** knob to adjust the range of hues that are included in the Background, expanding clockwise around the color wheel.
   a) Use the **Cntrl** knob to select **Sat**.
   b) Use the **Value** knob to adjust the saturation range of the background color.
      - Increasing the Saturation Range value includes a wider range of saturation values to be included in the background.
      - Decreasing the Saturation Range value includes a narrower range of saturation values to be included in the background.
9. Adjust the edges of the foreground as follows:
   a) Use the **Type** knob to select **Edge**.
   b) Use the **Cntrl** knob to select **Sens**.
   c) Use the **Value** knob to set the edge sensitivity.
      - **Low** — Reduces the level of detail in the edges of the chroma key as well as the overall noise in the key image that can be the result of certain lighting conditions or high detail camera settings. This is the default setting.
      - **High** — Include the maximum detail in the edges of the chroma key.
   a) Use the **Cntrl** knob to select **Soft**.
   b) Use the **Value** knob to add or remove edge softening of the foreground image and alpha channel.
      - Increasing the Softness value increases the amount of softness applied to the foreground edges and alpha channel.
      - Decreasing the Softness value decreases the amount of softness applied to the foreground edges and alpha channel.
10. Adjust the Foreground Area as follows:

    The Foreground settings allow you to adjust the range of colors which are considered Foreground colors, and thus keyed fully on.

    a) Use the **Type** knob to select **Foregd**.
    b) Use the **Cntrl** knob to select **Clip**.
    c) Use the **Value** knob to adjust the foreground clipping.
       - Increasing the Clip value removes lower-saturated colors from the Foreground image.
       - Decreasing the Clip value includes lower-saturated colors in the Foreground image.
    a) Use the **Cntrl** knob to select **Hue**.
    b) Use the **Value** knob to select the central, or base, color for the foreground.
       - Increasing the Hue value moves counter-clockwise around the color wheel to select a base color.
       - Decreasing the Hue value moves clockwise around the color wheel to select a base color.
    a) Use the **Cntrl** knob to select **Reject**.
    b) Use the **Value** knob to include or reject hues adjacent to the base color.
       - Increasing the Reject value decreases the amount of adjacent hues that are included in the foreground.
       - Decreasing the Reject value increases the amount of adjacent hues that are included in the foreground.
11. Adjust the luminance, or brightness, as follows:

    The luminance settings allow you to adjust the overall brightness of the Shadow, Translucent, and Transition areas to change the appearance of reflections from semi-transparent objects and

to match Shadow and Transition area brightness with the Foreground brightness.

a) Use the **Type** knob to select **Lum**.

b) Use the **Cntrl** knob to select **BkLuma**.

c) Use the **Value** knob to change the overall brightness of Shadow, Translucent, and Transition areas.

- Increasing the Background Luminance value increases the brightness of Background, Translucent, and Transition areas.
- Decreasing the Background Luminance value decreases the brightness of Background, Translucent, and Transition areas.

a) Use the **Cntrl** knob to select **Refl**.

b) Use the **Value** knob to change the brightness of semi-transparent reflections (like reflections from glasses).

- Increasing the Reflections value increases the brightness of semi-transparent reflections.
- Decreasing the Reflections value decreases the brightness of semi-transparent reflections.

12. Adjust the Shadow area as follows:

The Shadow adjustment allows you to extract a shadow from the background. This is the actual shadow that the foreground subject is casting onto the screen.

a) Use the **Type** knob to select **Shadow**.

b) Use the **Cntrl** knob to select **Gain**.

c) Use the **Value** knob to adjust the Shadow appearance.

- Increasing the Gain value creates darker shadows.
- Decreasing the Gain value creates lighter shadows.

a) Use the **Cntrl** knob to select **Range**.

b) Use the **Value** knob to adjust the range of the Shadow colors.

- Increasing the Range value widens the Shadow area by including lower-luminance background colors. The increased range comes as a result of colors moving from the Translucent area to the Shadow area.
- Decreasing the Range value narrows the Shadow area by excluding high-luminance colors. These excluded colors move back into the Translucent area.

13. Adjust the amount of background color that is spilling over into the foreground (green color cast on the foreground from a green-screen for example) as follows:

a) Use the **Type** knob to select **Spill**.

b) Use the **Cntrl** knob to select **Clip**.

c) Use the **Value** knob to adjust spill suppress clipping.

- Increasing the clip value removes higher-saturated colors from spill suppress correction.
- Decreasing the clip value includes higher-saturated colors in spill suppress correction. If your foreground image contains bright-colored areas that are suffering from background spill, decrease the clip value to have it corrected.

a) Use the **Cntrl** knob to select **Hue**.

b) Use the **Value** knob to select the central, or base, color for spill suppress correction. If the color spill does not appear to be the same color as the background, use this control to adjust which hue is considered to be "spilled" into the foreground.

- Increasing the hue value moves counter-clockwise around the color wheel while selecting a base color.
- Decreasing the hue value moves clockwise around the color wheel while selecting a base color.

a) Use the **Cntrl** knob to select **Reject**.

b) Use the **Value** knob to include or reject adjacent hues to the base.

- Increasing the reject value increases the amount of adjacent hues that are included in spill correction.
- Decreasing the reject value decreases the amount of adjacent hues that are included in spill correction.

14. Adjust the Transition area as follows:

    The Transition area is the range of pixels that are left over (i.e. not in the Shadow or Translucency area). The Transition settings allows you to adjust the appearance of the Transition area.

    a) Use the **Type** knob to select **Trans**.

    b) Use the **Cntrl** knob to select **Gain**.

    c) Use the **Value** knob to adjust the appearance of the Transition colors.

    - Increasing the Gain value makes the Transition area pixels more opaque.
    - Decreasing the Gain value makes the Transition area pixels more transparent.

15. Adjust the Translucency area as follows:

    The Translucency settings allow you to adjust the appearance of clear items such as eye-glass lenses.

    a) Use the **Type** knob to select **Trnslc**

    b) Use the **Cntrl** knob to select **Gain**

    c) Use the **Value** knob to adjust the appearance of the Translucent colors

    - Increasing the Gain value causes the translucent colors to appear more opaque.
    - Decreasing the Gain value causes the translucent colors to appear more transparent.

    a) Use the **Cntrl** knob to select **Range**.

    b) Use the **Value** knob to adjust the range of the Translucent colors.

    - Increasing the Range value widens the Translucent area by including more hues from the Background range (the lower-end of the range is defined by the Shadow range you just set).
    - Decreasing the Range value narrows the Translucent area by excluding hues.

16. Press **NEXT**.

17. Use the **Mask** knob to apply a mask to the key.

DVE Keys

The DVE Key allows you to apply digital video effects, such as scale, crop, aspect ratio, position, and border to video image.

To Set Up a DVE Key

A DVE key requires DVE resources that may not be available. Depending on how your switcher is configured, you may be asked to steal the resources from another element, or be prevented from using the resources.

1. Select the keyer that you want to set up a DVE Key on.
2. Select the video signal on the key bus that you want to use for the key.
3. Press **DVE** for the key type.
4. Use the **X Pos** knob to position the DVE key horizontally. You can also use the positioner.
5. Use the **Y Pos** knob to position the DVE key vertically. You can also use the positioner.
6. Use the **Size** knob to adjust the overall size of the DVE key vertically. You can also twist the positioner.
7. Press **NEXT**.
8. Use the **Aspect** knob to adjust the aspect ratio of the DVE key.
9. Use the **Border** knob to apply a border to the DVE key. Refer to the section *To Apply a Border to a DVE Key* on page 30 for information on borders.
10. Press **NEXT**. If a border is applied to the DVE key, you must press **NEXT** multiple times to get to the next step.
11. Crop the DVE key horizontally as follows:

    a) Use the **HCrop** knob to crop the DVE key horizontally on both the left and right sides at the same time.

    b) Press **HCrop** and use the **Left/R** knob to crop the DVE key horizontally on the left side only.

    c) Press **Left/R** and use the **L/Rgt** knob to crop the DVE key horizontally on the right side only.

12. Crop the DVE key vertically as follows:

    a) Use the **VCrop** knob to crop the DVE key vertically on both the top and bottom sides at the same time.

    b) Press **VCrop** and use the **Top/B** knob to crop the DVE key vertically on the top side only.

c) Press **Top/B** and use the **T/Bttm** knob to crop the DVE key vertically on the bottom side only.

13. Use the **Freeze** knob to freeze the DVE key. You can freeze the video and appearance of a DVE Key. When a DVE Key is frozen, the DVE attribute menus are disabled and you can not move the DVE Key or adjust DVE attributes.
14. Use the **Mask** knob to apply a mask to the key.

To Apply a Border to a DVE Key

1. Press **DVE** > **NEXT**
2. Use the **Border** knob to turn on the border and adjust the size of the border around the DVE key.
3. Use the **Soft** knob to adjust the softness of the border.
4. Press **NEXT**.
5. Select a color for the border.
   - Use the **Load** knob to select a preset color for the border.
   - Press **NEXT** and use the **BHue**, **BSat**, and **BLum** knobs to select your own color.

Masks

A Mask is a technique in which a pattern is combined with the key source to block out unwanted portions of the key source.

Two types of masks are available, Box masks and Pattern masks. All key types can be masked.

- **Box Mask** — used a simple box shape to mask out a portion of the key
- **Pattern Mask** — uses a pattern from the pattern generator to mask out a portion of the key

A Pattern Mask cannot be applied to a DVE key.

To Pattern Mask a Key

Pattern masks can be adjusted for size, location, rotation, and multiplication.

1. Select the keyer that you want to set up a mask for.
2. Press **NEXT**. Depending on the key type and features set up for the key, you must press **NEXT** multiple times to get to the next step.
3. Use the **Mask** knob to select **Pattrn**.
4. Use the **M-Frce** knob to force the area inside the mask region to the foreground (**On**).
5. Use the **M-Inv** knob to invert the masked area with the unmasked area (**On**). The portion of the key that was masked out is now visible, and the portion that was visible is masked.
6. Press **NEXT**.
7. Use the **Size** knob to adjust the size of the mask region. You can also twist the positioner.
8. Press **NEXT**.
9. Use the **Pattrn** knob to select the mask pattern you want to use. You can also select the pattern by pressing the pattern button directly.
10. Use the **X Pos** knob to position the mask horizontally. You can also use the positioner.
11. Use the **Y Pos** knob to position the mask vertically. You can also use the positioner.
12. Press **NEXT**.
13. Use the **Aspect** knob to adjust the aspect ratio of the pattern. Not all patterns can be adjusted.
14. Use the **Border** knob to turn on the border and adjust the size of the border.
15. Use the **Soft** knob to adjust the softness of the border.
16. Press **NEXT**.
17. Use the **Rot** knob to rotate the pattern. Not all patterns can be rotated.
18. Use the **HMult** knob to multiply the pattern horizontally.
19. Use the **VMult** knob to multiply the pattern vertically.

To Box Mask a Key

Box masks can be adjusted for size, location, rotation, and multiplication.

1. Select the keyer that you want to set up a mask for.
2. Press **NEXT**. Depending on the key type and features set up for the key, you must press **NEXT** multiple times to get to the next step.
3. Use the **Mask** knob to select **Box**.
4. Use the **M-Frce** knob to force the area inside the mask region to the foreground (**On**).
5. Use the **M-Inv** knob to invert the masked area with the unmasked area (**On**). The portion of the

key that was masked out is now visible, and the portion that was visible is masked.

6. Press **NEXT**.
7. Use the **X Pos** knob to position the mask region horizontally. You can also use the positioner.
8. Use the **Y Pos** knob to position the mask region vertically. You can also use the positioner.
9. Use the **Size** knob to adjust the size of the mask region.
10. Press **NEXT**.
11. Adjust the position of the left and right sides of the mask as follows:
    a) Use the **Left/R** knob to adjust the position of the left side of the box mask.
    b) Press the **Left/R** knob.
    c) Use the **L/Right** knob to adjust the position of the right side of the box mask.
12. Adjust the position of the top and bottom sides of the mask as follows:
    a) Use the **Top/B** knob to adjust the position of the top side of the box mask.
    b) Press the **Top/B** knob.
    c) Use the **T/Bttm** knob to adjust the position of the bottom side of the box mask.

Split Keys

A Split key allows you to assign a different alpha source for a key than the fill/alpha associations that are set up during configuration or to use a separate alpha source for a Self key.

A split key can be applied to an **AUTO SELECT**, or **SELF KEY**.

To Set Up a Split Key

A split key works on an **Auto Select** or **Self Key** that has been set up and you want to apply a different alpha to.

1. Set up your key with the video source you want to use.
2. Press and hold the **Auto Select** or **Self Key**, depending on the key type you are splitting.
3. Use the **Alpha** knob to select a different alpha source if required.
4. Press the **Alpha** knob to accept the new alpha.

Key Copy

You can copy the entire contents of a keyer to another keyer in the same, or a different MLE. The entire contents of the destination keyer are replaced with the contents of the source keyer.

When you copy a key, the switcher tries to assign resources to the destination key to match the source key. If these resources are not available, the switcher steals resources in the following order.

1. From off-air keys that are not the source key.
2. From the source key, if it is not on-air.
3. From on-air keys that are not the source key.
4. From the source key, even if it is on-air.

To Copy a Keyer to Another

This procedure copies the contents of Key 1 to Key 3 as an example. Use the same procedure for any key combination.

1. Press and hold the **KEY 3 SEL** button.

   This is the destination keyer that you want to copy to.
2. Press the **KEY 1 SEL** button.

   This is the source keyer that you want to copy from.

Key Swap

You can swap the entire contents of any two keyer in the same, or different MLEs. The video source, position, and key type are all swapped between keyers. This allows you to change the apparent key priority, or layering, of the keys in the video output. For example, key 3 appears over key 2. If you perform a swap between key 3 and key 2, it appears as if key 2 is now over key 3.

Keep the following in mind when performing a key swap:

- Key swap does not change the on-air status of a keyer.
- If a DVE key is set to freeze, it will be unfrozen by the swap.
- A key swap can be recorded as part of a custom control.
- You cannot swap between keyers on different MLEs on a Carbonite 1 control panel.

To Perform a Key Swap

This procedure swaps the contents of Key 2 and Key 3 as an example. Use the same procedure for any key combination.

1. Press and hold the **KEY 2 SEL** button.
2. Press the **KEY 3** button in the next transition area.

Memory Functions

A memory register is a snapshot of the current state of the switcher that can include one or multiple MLEs. Up to 100 memory registers (10 banks of 10 registers) per MLE can be stored and recalled on the switcher. Each of these memory registers can store as little as the information of one MLE, or as much as the current state of the entire switcher, including all MLEs, Aux Buses, and DVE settings.

Memory Access Mode

Switcher memories can be accessed either through **Direct Access** or **Bank** mode.

- **Direct Access** — enter the bank and memory number to store or recall a memory
- **Bank** — enter the memory number to store or recall a memory (the bank is locked)

To Set the Memory Access Mode

The memory access mode applies to both memory storing and recalling.

1. Press **STORE**.
2. Use the **Mode** knob to select the memory access mode you want to use.

Storing Memories

When you store a memory, you are storing the complete state of that panel row. This includes the current state of all the area on the MLE, including keyer settings, transition rates, wipe and pattern selections, and source selections. In addition to the current state panel, the current settings for the various keyers, such as chroma key settings, and clip and gain settings, are also stored.

To Store a Memory (Carbonite 1)

To store a memory, you must select which MLE to store the memory for, and then use the pattern buttons to select the bank and register to store the memory in.

1. Press **STORE** > **NEXT** and use the knob to select the MLE, or all MLEs that you want to store the memory for.
2. Use the numbers on the pattern buttons to select the bank and register you want to store the memory to. For example, press ◩ and then ◈ to select bank 4, register 9.

The memory has been stored to the selected memory register and the **RECALL** button is selected.

To Store a Memory (All Other Panels)

To store a memory, you must select which MLE to store the memory for, and then use the pattern buttons to select the bank and register to store the memory in.

1. Press **MLE 1 STORE**, **MLE 2 STORE**, or both to select the MLE to store the memory for.
2. Use the numbers on the mnemonic buttons to select the bank and register you want to store the memory to.

The memory has been stored to the selected memory register and the **MLE 1 RECALL** button is selected.

Recalling Memories

When you recall a memory, the existing configuration of that MLE is replaced with the settings stored in the memory.

Keep the following in mind when recalling memories:

- How a memory is recalled depends on the how the **Memory Attributes** are set.
- Recalling a memory that includes a new media-store image to be loaded from a USB drive may result in the currently loaded image to be displayed for a few frames while the new image is loaded.
- Recalling a memory that includes a source assigned to a camera also recalls the shot stored in the memory for that camera if the **CamRcl** memory attribute is set to **Recall**. There is no delay in the memory recall so camera movement may be visible while the shot is recalled.
- You can exit without recalling a memory register by pressing any button other than a Wipe Pattern, dedicated key transition, CUT, AUTO TRANS, or source button.
- You can override the video source stored in a memory by pressing and holding a source button and recalling the memory (**Bus Hold**). The held source button overrides the source that is recalled with the memory for that bus. The memory is not affected by a Bus Hold and will recall properly without the Bus Hold.
- Enabling Memory AI mode changes the way key elements are recalled. If a key is currently on-air, the element for that key is recalled in the next available off-air key. If there is no available off-air keys, the element is not recalled. All resource

sharing is set to FLOAT mode so that key elements may be recalled to other keys than originally stored.

To Recall a Memory (Carbonite 1)

To recall a memory, you must select which MLE to recall the memory for, and then use the pattern buttons to select the bank and register to recall the memory from.

1. Press **RECALL** > **NEXT** and use the knob to select the MLE, or all MLEs that you want to recall the memory for.
2. Use the numbers on the pattern buttons to select the bank and register you want to recall the memory from. For example, press ◩ and then ⊡ to select bank 4, register 9.

To Recall a Memory (All Other Panels)

To recall a memory, you must select which MLE to recall the memory for, and then use the pattern buttons to select the bank and register to recall the memory from.

1. Press **MLE 1 RECALL**, **MLE 2 RECALL**, or both to select the MLE to recall the memory for.
2. Use the numbers on the mnemonic buttons to select the bank and register you want to recall the memory from.

The memory has been stored to the selected memory register and the **MLE 1 RECALL** button is selected.

Memory Recall Mode

The Memory Recall mode sets how a memory is recalled. This includes whether a memory is recalled on-air, or only on the program bus, or if effects such as Effects Dissolve or DVE Dissolve are used.

To Set Up the Recall Mode Memory Attribute

1. Press **RECALL** > **NEXT**.
2. Use the **Attrib** knob to select **Recall Mode**.
3. Use the **Value** knob to select the memory recall mode you want to use.
   - **Memory** — memory attributes stored with the memory are used
   - **PGM** — all elements are recalled as stored (default)
   - **MemAI** — transition area is configured to take the on-air elements of the memory on-air with the next transition
   - **EffDis** — on-air elements listed below are transitioned to the elements stored in the memory
     - Matte colors (background, wash or borders)
     - Keyer settings like clip, gain, transparency
     - Mask position and size
     - Chroma key settings, except the background color
     - Pattern settings like size, position, aspect, border, softness, rotation
     - DVE settings like size, position, aspect, border, softness, cropping
     - Media-Store x/y position
     - Transition Progress

To Set the Effects Duration

Effects duration applies Effects Dissolves, and sets the length of time that the switcher will use to transition from the on-air scene to the scene stored in the memory.

1. Press **RECALL** > **NEXT**.
2. Use the **Attrib** knob to select **EffDur**.
3. Use the **Value** knob to select duration you want to use to transition from the current on-air scene to the on stored in the memory.
   - **Memory** — the duration stored in the memory is used
   - **1-999fr** — sets a specific duration in frames

Memory Attributes

Memory Attributes allow you to specify what elements recalled with a memory, as well as adding effects to memory recalls. These elements include the background/preset buses, keyer bus, Aux bus, and Media-Store selections, as well as keyer on-air status, and transition selections.

In addition to setting which sources to recall with the memory, effects such as performing an auto transition after the memory recall or running a custom control after the memory recall, can also be included.

Memory attributes can be set both when the memory is stored, and when it is recalled. This allows you to store a set of attributes with a memory and then recall it as stored, or override the attributes stored in the memory and apply different ones when the memory is recalled.

A memory attribute does not need to be stored in the memory to be recalled.

To Set the Program Bus Source Attribute

1. Press **RECALL** > **NEXT** > **NEXT**.
2. Use the **Attrib** knob to select **PGMBus**.
3. Use the **Value** knob to select how the sources selected on the program bus are recalled.
   - **Memory** — settings come from the memory being recalled
   - **NoRcl** — sources are not recalled on the program bus
   - **Recall** — sources are recalled on the program bus (default)

To Set the Preset Bus Source Attribute

1. Press **RECALL** > **NEXT** > **NEXT**.
2. Use the **Attrib** knob to select **PSTBus**.
3. Use the **Value** knob to select how the sources selected on the preset bus are recalled.
   - **Memory** — settings come from the memory being recalled
   - **NoRcl** — sources are not recalled on the preset bus
   - **Recall** — sources are recalled on the preset bus (default)

To Set the Transition Type Attribute

1. Press **RECALL** > **NEXT** > **NEXT**.
2. Use the **Attrib** knob to select **Trans**.
3. Use the **Value** knob to select how the next transition type and parameters are recalled.
   - **Memory** — settings come from the memory being recalled
   - **NoRcl** — transition selections are not recalled
   - **Recall** — transition selections are recalled (default)

To Set the Next Transition Attribute

1. Press **RECALL** > **NEXT** > **NEXT**.
2. Use the **Attrib** knob to select **NextTr**.
3. Use the **Value** knob to select how the next transition area is recalled.
   - **Memory** — settings come from the memory being recalled
   - **NoRcl** — next transition area settings are not recalled
   - **Recall** — next transition are settings are recalled (default)

To Set the Run Auto Trans Attribute

1. Press **RECALL** > **NEXT** > **NEXT**.
2. Use the **Attrib** knob to select **RnAuto**.
3. Use the **Value** knob to select whether a transition is performed after the memory is recalled.
   - **Memory** — settings come from the memory being recalled
   - **NoRun** — a transition is not performed after the memory is recalled (default)
   - **Run** — a transition is performed after the memory is recalled

To Set the Shared Pattern Generator Attribute

1. Press **RECALL** > **NEXT** > **NEXT**.
2. Use the **Attrib** knob to select **SrdPat**.
3. Use the **Value** knob to select whether the settings for the shared Key Mask/Wash pattern generator is recalled.
   - **Memory** — settings come from the memory being recalled
   - **NoRcl** — shared pattern generator settings are not recalled
   - **Recall** — shared pattern generator settings are recalled (default)

To Set the Key Bus Sources Attribute

1. Press **RECALL** > **NEXT** > **NEXT**.
2. Use the **Attrib** knob to select **KeyBus**.
3. Use the **Key** knob to select the keyer you want to use the attribute for.
4. Use the **Value** knob to select whether sources selected on the selected key bus are recalled.
   - **Memory** — settings come from the memory being recalled
   - **NoRcl** — sources are not recalled on the key bus

- **Recall** — sources are recalled on the key bus (default)

To Set the Key On-Air Attribute

1. Press **RECALL** > **NEXT** > **NEXT**.
2. Use the **Attrib** knob to select **KeyBus**.
3. Use the **Key** knob to select the keyer you want to use the attribute for.
4. Use the **Value** knob to select whether sources selected on the selected key bus are recalled.
   - **Memory** — settings come from the memory being recalled
   - **NoRcl** — sources are not recalled on the key bus
   - **Recall** — sources are recalled on the key bus (default)

To Set the Key Type Attribute

1. Press **RECALL** > **NEXT** > **NEXT**.
2. Use the **Attrib** knob to select **KType**.
3. Use the **Key** knob to select the keyer you want to use the attribute for.
4. Use the **Value** knob to select whether the key type is recalled for the selected key.
   - **Memory** — settings come from the memory being recalled
   - **NoRcl** — key type is not recalled
   - **Recall** — key type is recalled (default)

To Set the Key Mask Attribute

1. Press **RECALL** > **NEXT** > **NEXT**.
2. Use the **Attrib** knob to select **KMask**.
3. Use the **Key** knob to select the keyer you want to use the attribute for.
4. Use the **Value** knob to select whether mask settings for the selected key are recalled.
   - **Memory** — settings come from the memory being recalled
   - **NoRcl** — key mask settings are not recalled
   - **Recall** — key mask settings are recalled (default)

To Set the Media-Store Attribute

1. Press **RECALL** > **NEXT** > **NEXT**.
2. Use the **Attrib** knob to select **Media**.
3. Use the **Media** knob to select the Media-Store channel you want to use the attribute for.
4. Use the **Value** knob to select whether Media-Store image and settings for the selected channel are recalled.
   - **Memory** — settings come from the memory being recalled
   - **NoRcl** — Media-Store image and settings are not recalled (default)
   - **Recall** — Media-Store image and settings are recalled

To Set the Aux Bus Attribute

1. Press **RECALL** > **NEXT** > **NEXT**.
2. Use the **Attrib** knob to select **Aux**.
3. Use the **Aux** knob to select the aux bus you want to use the attribute for.
4. Use the **Value** knob to select how the sources selected on the aux bus are recalled.
   - **Memory** — settings come from the memory being recalled
   - **NoRcl** — sources are not recalled on the aux bus (default)
   - **Recall** — sources are recalled on the aux bus

To Set the Camera Shot Attribute

1. Press **RECALL** > **NEXT** > **NEXT**.
2. Use the **Attrib** knob to select **CamRcl**.
3. Use the **Value** knob to select whether camera shots are recalled.
   - **Memory** — settings come from the memory being recalled
   - **NoRcl** — camera shots are not recalled
   - **Recall** — camera shots are recalled (default)

To Set the Roll GPO Attribute

1. Press **RECALL** > **NEXT** > **NEXT**.
2. Use the **Attrib** knob to select **RllGPO**.
3. Use the **Value** knob to select whether GPI outputs attached to sources are triggered when recalled.

- **Memory** — settings come from the memory being recalled
- **NoRoll** — GPI outputs are not triggered
- **Roll** — GPI outputs are trigged (default)

To Set the Roll VTR Attribute

1. Press **RECALL** > **NEXT** > **NEXT**.
2. Use the **Attrib** knob to select **RllVTR**.
3. Use the **Value** knob to select whether a play command is trigged when a source that is assigned to a video server is recalled.
   - **Memory** — settings come from the memory being recalled
   - **NoRoll** — play command is not triggered
   - **Roll** — play command is triggered (default)

Switcher Sets

The switcher stores configuration and operation data in a number of registers that contain the individual entries for items such as memories or personality settings. These registers can be stored as a single archive file, or as a register set that contains all the individual register of that type; all memories for example. These files are stored into Setups on USB drive. Different Setups can be created for different shows or applications, allowing you to quickly locate and recall the switcher configurations.

The switcher stores information in the following registers:

- **Memory** — contains all the memories for all MLEs
- **Custom Control** — contains all the custom control banks and macros
- **Personality** — contains all the user interface settings, such as transition rates, that are stored under the **PERS** menu
- **Installation** — contains all the external device setup, and software settings for the switcher

To Store a Set

Switcher Sets can only be stored to a USB drive. The USB drive must be present before you try to store the settings. A total of 10 Sets of switcher setup information can be stored onto the same USB drive.

1. Insert a USB drive into the USB Port on the switcher. You must wait 5 seconds for the switcher to recognise the USB drive.
2. Press **MENU** > **SAVE**.
3. Use the **Save** knob to select the set (**0-9**) you want to store the switcher registers to.
4. Press the knob to select the registers you want to store to the selected set. If an (*) is shown on the menu, that register already exist in the set and will be overwritten.
   - **ALL** — store all registers to the set
   - **Mems** — store only the memory registers to the set
   - **Cust** — store only the custom control registers to the set
   - **Pers** — store only the personality registers to the set
   - **Inst** — store only the installation registers to the set
5. Press **Confrm**.

To Load a Set

Switcher Sets can only be loaded from a USB drive. The USB drive must be present before you try to load the settings.

1. Insert your USB drive into the USB Port on the switcher. You must wait 5 seconds for the switcher to recognise the USB drive.
2. Press **MENU** > **LOAD**.
3. Use the **Load** knob to select the set (**0-9**) you want to load the switcher registers from.
4. Press the selected set. Only registers with an (*) shown on the menu exist in the set.
   - **ALL** — recall all registers from the set
   - **Mems** — recall only the memory registers from the set
   - **Cust** — recall only the custom control registers from the set
   - **Pers** — recall only the personality registers from the set
   - **Inst** — recall only the installation registers from the set
5. Press **Confrm**.

Media-Store

Media-Store allows you to load stills, animations, or audio files from the USB drive and make them available across all MLEs. Two channels of media-store with alpha, or four channels without alpha, are provided.

Keep the following in mind when working with media-stores:

- A still, animation, or audio can be loaded either by browsing the file system, or by entering the still number using the pattern buttons.
- An audio file with the same filename as a still or animation is automatically associated with that still or animation.
- You can clear a media-store channel by loading media number 000.
- If you are loading an Auto Key into a media-store channel, you must have another media-store channel associated with the current one to load the alpha into.
- An FTP connection using RossLinq can be created from an external device directly to a Media-Store channel on the switcher.
- Audio data is embedded into the ancillary data space of the Media-Store channel output.
- A Media-Store channel can be loaded with Audio only.

Media-Store Modes

Media-store channels can be set up to operate independently, or paired, with one channel providing the key, and the other the alpha.

- **Swish** — Two channels of media-store are available. Each channel can contain an image or channel 1 can contain an image and an associated alpha in channel 3. channels 2 and 4 are reserved for media transitions.
- **Swish+** — Four channels of media-store are available. channel 2 (video) and channel 4 (alpha) can also be used for media transitions. Channels 2 and 4 are not reserved.

To Set the Media-Store Mode

1. Press **MENU** > **SYSTEM** > **NEXT**.
2. Use the **Media** knob to select the media-store mode.
   - **Swish** — two (2) channels are available or channel 1 for key and channel 2 for alpha (channels 2 and 4 are reserved for Media Transitions)
   - **Swish+** — four (4) channels are available
3. Press the **Media** knob.
4. Press the **Confrm** knob.

Loading Stills or Animations

Stills or animations can be loaded into media-store channels either from USB or the internal cache using the media number, or by browsing to the file.

Note: *The internal cache is used for sample images only and cannot be used to store user stills or animations.*

Media numbers are 4-digit numbers that are assigned to stills or animations and allow you to load stills or animations directly using the pattern buttons. Each media number is made up of three sections, the Place (0-1), the Bank (00-99), and the Item Number (0-9). The Place is either 0 for internal stills, or 1 for external.

Media-Store File Specifications

Media-Store images and animations must be 24-bit or 32-bit (24-bit image plus 8-bit embedded alpha channel) Targa files, PNG, JPG, or BMP images to be used by the switcher. For animations, the targa files must be numbered to indicate the order they go in. For audio, 20-bit or 24-bit wav files of the same name as the still or animation are used to associate audio with a still or animation.

Anim_001.tga
Anim_002.tga
Anim_003.tga
...
Anim_100.tga

Together, these files are treated as a single animation named Anim that is 100 frames long.

Files names cannot contain symbols such as **! @ # & * ( ) / , ? ' "** and cannot start with an underscore (_).

To Load a Still or Animation

Stills or animations can be loaded from the USB drive, or from the internal cache. Only the default images that came with your switcher are available on the internal cache.

1. If you are loading a file from USB, insert your USB drive into the USB Port on the switcher. You must wait 5 seconds for the switcher to recognise the USB drive.

If the files on your USB are new, it takes about 2 seconds per file for the switcher to generate the thumbnail for the MultiUser GUI. Once all the thumbnails are generated, they are displayed in the Media Manager window.

2. Press the source button for the media-store channel that you want to load a still into. If the file has an alpha, the paired channel will load the alpha as well.
3. Press the **Browse** knob.
4. Use the left knob to navigate to the file your want to load. Press the knob to make a selection.
   - **<..>** — up one
   - **USB(1)** — the USB drive
   - **Internal(0)** — the internal cache
   - **<folder>** — a sub-folder of the name "folder"
   - **image** — a still of the name "image"
   - **image.tga .wav** — a still with an associated audio file (not in the database)
   - **image [V][A]** — a still with an associated audio file (in the database)
   - **animation [V10]** — a 10 frame animation of the name "animation" (in the database)
   - **animation.tga[10] .wav** — a 10 frame animation with an associated audio file (not in the database)
   - **animation [V10][A]** — a 10 frame animation with an associated audio file (in the database)

A still or animation can be loaded using the **Media Number** for the still and the pattern buttons.

To Load Stills Using Media Numbers

How you load a still using the media number depends on whether the Place or Media are locked. If the Place is locked, you only have to enter the 3-digit Media number. If the Place and Media are locked, you only have to enter the last digit of the Media number.

Note: *Loading 000 clears the current Media-Store channel.*

1. Insert your USB drive into the USB Port on the switcher. You must wait 5 seconds for the switcher to recognise the USB drive. If you are loading a file from the internal cache, you do not need the USB drive.
2. Press the source button for the media-store channel that you want to load a still into. If the file has an alpha, the paired channel will load the alpha as well.
3. Using the pattern buttons, enter the media number for the still you want to load.

   For example, press **1051** to select the USB(1) drive, Media 051.
4. Press the **Select** knob.

Media-Store Capture

Still images can be captured from any input BNC, Aux Buses, as well as the program, preview, and clean feed from any MLE.

To Capture a Still

1. If you are capturing to a USB, insert your USB drive into the USB Port on the switcher. You must wait 5 seconds for the switcher to recognise the USB drive.
2. Press the source button for the media-store channel that you want to capture a still into.
3. Press the **Capt** knob.
4. Press the **P/B** or **E/E** knob to select the mode you want the media-store in.
   - **E/E** — electronic-to-electronic, or record, mode allows you to record a still
   - **P/B** — playback mode allows you to review your still
5. Use the **P/B** or **E/E** knob to select the video source that you want to perform the capture of.
6. Press **NEXT**.
7. Use the **USB** knob to select the location that you want to store the captured still to.
8. Use the **Alpha** knob to select whether you want to capture the alpha signal (**Yes**) or not (**No**). You must have an input BNC or an Aux Bus selected as the capture source to capture the alpha.
9. Press **NEXT**.
10. Use the **Capt** knob to select a number for the still you want to capture.
11. Press the **Capt** knob to perform the capture. The new media item is stored and the media number is increased by one.

Media-Store Attributes

Attributes are applied to the image or animation directly, regardless of the channels that the image or animation are loaded in. If you adjust the attributes of the still in one channel, these settings are applied to that image or animation in all other channels that the same image or animation is loaded into.

Understanding the Attributes Menu

When you select a still or animation, the menu system displays a number of attributes that allow you to adjust how a the image or animation appears. The options that are available depend on the type of media-store image or animation that is selected.

Table 6: Attributes Menu Items

Menu Item	Description
X Pos	selects the horizontal position of the image or animation
Y Pos	selects the vertical position of the image or animation
Shaped	selects shaped or unshaped for the alpha of the image or animation
Looping	selects whether the animation loops automatically or not
Reverse	selects whether the animation plays in reverse or not
AutoPly	selects whether the animation starts playing automatically when taken on-air or not
Speed	selects the speed that an animation plays at (0.1-10)
Media#	selects the media number that you want to use to recall the still or animation
CutFr	selects the point, in frames, from the start of the animation that the background cut occurs
GPO	selects the GPI output that you want to trigger by a media transition
GPOFr	selects the time, in frames, from the start of the media transition that the GPI output is triggered
Mute	selects whether the associated audio is turned on or off during playback

To Set Media-Store File Attributes

The attributes that you can set depend on whether the file you are setting them for is a still or animation.

1. Insert your USB drive into the USB Port on the switcher. You must wait 5 seconds for the switcher to recognise the USB drive. If you are loading a file from the internal cache, you do not need the USB drive.
2. Press the source button for the media-store channel that you want to load a still into. If the file has an alpha, the paired channel will load the alpha as well.
3. Press **NEXT**.
4. Use the **Attrib** knob to select the attribute you want to set, and the **Value** knob to select the value you want to assign to the attribute.
   - **X Pos** — selects the horizontal position of the image or animation
   - **Y Pos** — selects the vertical position of the image or animation
   - **Shaped** — selects shaped or unshaped for the alpha of the image or animation
   - **Looping** — selects whether the animation loops automatically or not
   - **Reverse** — selects whether the animation plays in reverse or not
   - **AutoPly** — selects whether the animation starts playing automatically when taken on-air or not
   - **Speed** — select the speed that an animation plays at (0.1-10)
   - **Media#** — select the media number that you want to use to recall the still or animation
   - **CutFr** — select the point, in frames, from the start of the animation that the background cut occurs
   - **GPO** — select the GPU output that you want to trigger by a media transition
   - **GPOFr** — select the time, in frames, from the start of the media transition that the GPI output is triggered
   - **Mute** — select whether the associated audio is turned on or off during playback
5. Use the **Func** knob to select how you want to save the attributes.
   - **Save** — saves the adjustments for the selected **Attrib** value only
   - **SavAll** — saves the adjustments for all **Attrib** values
   - **Revert** — undoes the adjustments for the selected **Attrib** value only
   - **RevAll** — undoes the adjustments for all **Attrib** values
6. Press the **Func** knob to make the selection.

To Lock a Media Number Place and Bank

Locking the Media Number Place and Bank means that you do not have to enter them when loading a still. Lock setting are specific to the channel they are set on.

1. Press the source button for the media-store channel that you want to set the Place and Bank lock settings for.
2. Press the **Browse** knob.
3. Press **NEXT**.
4. Use the **Place** knob to select USB or Internal.
5. Press the **Place** knob to toggle the lock on or off. Locked is shown with [] around the name.
6. Use the **Media** knob to select the bank you want to lock to.
7. Press the **Media** knob to toggle the lock on or off. Locked is shown with [] around the name.

Working With Media-Store Animations

Media-Store animations are used for things animated backgrounds, branding "bugs", or media transitions. You can set up an animation to loop, play automatically when take on-air, play in reverse, or even play at different speeds.

You can play an animation manually by selecting the source button for the media-store channel with the animation you want to play, and pressing **Run**. The knob changed to **Stop** as the animation is playing.

Keep the following in mind when working with media-store animations:

- When you load an animation to an off-air media-store channel, or the animation goes off-air with a transition, the preview shows the cut point (**CutFr**) for that animation, and not the first frame of the video.
- You can manually cycle through frames by turning the **Run** knob while the animation is stopped.
- Double-pressing the **Run** knob stops playback and re-cues the animation to the first frame.
- You can shuttle forwards and backwards through the animation by turning the positioner clockwise or anti-clockwise when the animation is stopped. Shuttle speed is increased and decreased by turning the positioner more or less in each direction.
- You can run or stop an animation by pressing the button on the top of the positioner.

Working with Media-Store Audio

Audio can be added to the playout of a Media-Store channel either by loading the file directly, or by naming the audio file the same an the animation or still you want it to play out with. When you load the still or animation, the switcher will automatically load the audio file of the same name.

Keep the following in mind when working with audio:

- Audio is stored in WAV files at 48kHz with multi-channel support of up to 16 channels.
- Audio plays out on Program, Preview, Aux, and MultiViewer outputs only.
- An audio file does not need to be of the same length as the animation it is associated with.
- A still with audio or audio only have the Auto Play and Looping attributes. These apply to the audio playout.
- The looping time of an animation with audio is the length of the animation.

Custom Controls

Once programmed, a custom control can be played back by pressing a button. The custom control can be as simple as triggering an output GPI pulse, or as complex as recalling a specific memory register on an MLE, performing a switcher transition, and selecting a group of keys.

Custom Control Setup

The custom control interface on your switcher can be customized to show custom control names on the mnemonics just below the Custom Control bus, or automatically add delays between each custom control event as you are recording a custom.

To Set Custom Control Options

1. Press **BANK 1** > **EDIT** > **NEXT**.
2. Use the **Row** knob to select the control panel row that you want to set how the custom control names appear on the mnemonics.
3. Use the **CCMem** knob to set how custom control names are shown on the mnemonics.
   - **Off** — only video source names are shown
   - **Split** — mnemonics are split with custom control names on the top and source names on the button
   - **Full** — only custom control names are shown
4. If you selected **Split**, use the **MColor** knob to select whether the mnemonics use the bus map color (**Xpt**) or the custom control color (**CC**).
5. Use the **CCPaus** knob to set whether pauses are added automatically after each event.
   - **Manual** — pauses are not added automatically
   - **Record** — each command is automatically separated from the previous command by a pause equal to the real-time delay between the user entering commands

Recording Custom Controls

When you create a custom control, you record a series of button presses on the panel, as well as special functions, that are played back when you run the custom control.

Almost any action or setting can be stored in a custom control, with the following exceptions:

- Diagnostic Functions
- Confirmation Dialogs
- Panel-Specific Functions

To Record a Custom Control

A basic custom control records a series of button presses on the control panel. If the **CCPaus** feature is set to **Record**, pauses will automatically be added between button pressed. If it is set to **Manual** you will have go back and edit the custom control to add the pauses.

1. Press **MENU** > **BANK 1** > **START/STOP**.
2. Use the **Bank** knob to select the bank that the custom control you want to record will be stored on, or select the bank button directly.
3. Use the **CC** knob to select the custom control that you want to record, or select the custom control on the bus directly. If the custom control already has a macro recorded, an ***** is shown next to the number.
4. Press **START/STOP** to start recording.
5. Insert the events you want to record. These can include source selections, key types, transitions, and menu selection, for example. Special functions can also be inserted.

   Each custom control can have a maximum of 99 events, plus the End event.
6. Press **START/STOP** to finish recording. You can also press **CANCEL** if you do not want to store your changes to the custom control.

Special Functions

Special functions allow you to include events not associated with a button press into a custom control. A special function can be inserted into any existing custom control, or used when creating a new custom control.

Hold

Allows you to place a command in a custom control that will stop the custom control at the hold. You must press the custom control button again, or use a GPI trigger, to continue the custom control.

Pause

Allows you to place a command in a custom control that will stop a custom control at the pause. The length of the pause is set when the pause is inserted.

When holding the **INSERT** button, pauses are shown as **Px**, where **x** is the length of the pause in frames.

Loop

Allows you to have a custom control run continuously until stopped, or a Cancel/Cancel All custom control command is executed from another custom control.

GPO

Allows you to trigger a pre-selected GPI output using a custom control. The specific GPI output is set when the GPO command is inserted.

CutKey

Allows you create a custom control that will cut keys on or off. The specific key and whether the key is cut on or off is set when the key cut command is inserted.

TrnKey

Allows you to create a custom control that will transition keys on or off. The specific key and whether the key is transitioned on or off is set when the key transition command is inserted.

IncKey

Allows you to create a custom control that will include a key with the next transition to take the key on-air, or off-air. The specific key and whether it should go on-air, or off-air is set when the include key command is inserted.

Cancel

Allows you to stop a particular custom control. The specific custom control is set when the cancel is inserted.

CancelAll

Allows you to stop all running custom controls.

State

Allows you to embed the entire state of an MLE into a custom control. A state in a custom control behaves just like a memory.

To Insert a Special Event into a Custom Control

A special function can be inserted into any existing custom control, or used when creating a new custom control.

1. Start recording or editing your custom control where you want to insert the special event.
2. Press **INSERT**.
3. Use the **INSERT** knob to select the event you want to insert.

   You can also press and hold the **INSERT** button and press the source button on the custom control bus for the event you want to insert. The event names are shown on the mnemonics.

   - **Hold** — press the **Hold** knob to insert a hold
   - **Pause** — use the **Secs** and **Frames** knobs to enter the length of the pause
   - **Loop** — press the **Loop** knob to loop the custom control back to the beginning
   - **GPO** — use the **Pin** knob to select the GPI output
   - **CutKey** — use the **Key** knob to select the key, and the **State** knob to select whether you want the key cut on or off
   - **TrnKey** — use the **Key** knob to select the key, and the **State** knob to select whether you want the key transitioned on or off
   - **IncKey** — use the **Key** knob to select the key, and the **State** knob to select whether the key should be transitioned on-air or off-air with the next transition
   - **Cancel** — use the **Bank** knob to select the custom control bank, and the **CC** knob to select which custom control to cancel
   - **CancelAll** — press the **CancelAll** knob to insert a cancel all custom controls command
   - **State** — use the **MLE** knob to select the MLE
4. Press the **Insert** knob to insert the event.
5. Press **START/STOP**

Running a Custom Control

Once a custom control has been programmed, you can run that custom control by pressing the button that the custom control was recorded to.

Keep the following in mind when running custom controls:

- A custom control will continue to run until it reaches a hold, is stopped by another custom control, you edit a custom control, or the custom control reaches the end.
- When a custom control is running, the button on the custom control bus is red.
- When a custom control is held (at Hold), the button on the custom control bus flashes white.

- You can run multiple custom controls at the same time. The number of running custom control is shown on the display when in custom control mode.
- You can stop a running custom control by pressing the red custom control button on the custom control bank.
- A maximum of 128 custom controls can be run at the same time.

To Run a Custom Control

Once a custom control has been recorded, you can run that custom control at any time.

1. Press **MENU**.
2. Select the bank that the custom control you want to run is on by pressing the bank button.
3. Select the custom control you want to run by pressing the source button on the custom control bus.
   The custom control starts to play immediately.

Editing Custom Controls

After you have recorded a custom control, you can go back and edit that custom control to add or remove events.

To Edit a Custom Control

When editing a custom control, you can delete and insert events at any point in the custom control, or append events to the end.

Tip: *When editing a custom control, press **RUN EVENT** to run the currently selected event. This can help you diagnose problems in a custom control.*

1. Press **MENU** > **BANK 1** > **EDIT**.
2. Use the **Bank** knob to select the bank that the custom control you want to record will be stored on, or select the bank button directly.
3. Use the **CC** knob to select the custom control that you want to edit, or select the custom control on the bus directly. The custom control will have an ***** next to the number.
4. Use the **Func** knob to select where and how you want to edit the custom control.
   - **Edit** — select the position in the custom control to edit events
   - **Append** — add events to the end of the custom control
5. Press the **Func** knob to start editing.

   You can also start editing a custom control by pressing and holding **EDIT** and selecting the bank and custom that you want to edit to.
   The display changes to show the name and duration of the custom control, and the currently selected event in the custom control.
6. Delete an event in a custom control as follows:
   a) Use the left knob to select the event you want to delete. You can also use the **PREV** and **NEXT** buttons.
   b) Press **DELETE**.
7. Insert an event into a custom control as follows:
   a) Use the left knob to select the event you want insert an event before. You can also use the **PREV** and **NEXT** buttons.
   b) Press **INSERT**.
   c) Insert the events you want.
8. Press **START/STOP** to finish recording.

Naming Custom Controls

Each custom control can be given a unique name and mnemonic color. The name is shown in the mnemonic display when CCMnem is set to Split or Full.

To Name a Custom Control

The procedure to name or rename a custom control is the same.

1. Press **MENU** > **BANK 1** > **EDIT**
2. Use the **Bank** knob to select the bank that the custom control you want to name is stored on, or select the bank button directly.
3. Use the **CC** knob to select the custom control that you want to name, or select the custom control on the bus directly.
4. Use the **Func** knob to select **Rename**.
5. Press the **Func** knob.
6. Select a name as follows:
   a) Use the **Pos** knob to select the character position too edit. A name can have up to 8 character.
   b) Use the **Char** knob to select a character for the current position.
7. Press **NEXT**.

8. Use the **Size** knob to select the text size for the mnemonic label.
   - **Small** — 6 characters displayed on the top line, and 2 on the bottom
   - **Medium** — 4 characters displayed on the top line, and 4 on the bottom
   - **Large** — first 2 characters are displayed
9. Use the **Color** knob to select the background color of the mnemonic.
10. Use the **Inv** knob to swap the color of the text and the background.

    The Invert (Inv) selection is not applied when the mnemonic is in split mode. In split mode, the top half of the display is inverted, and the bottom is not.

Deleting Custom Controls

Any custom control on the switcher can be deleted to remove unused customs to free up space for new custom controls.

To Delete a Custom Control

There is no undo for this delete function.

1. Press **MENU** > **BANK 1** > **DELETE**
2. Use the **Bank** knob to select the bank that the custom control you want to delete is stored on, or select the bank button directly.
3. Use the **CC** knob to select the custom control that you want to delete, or select the custom control on the bus directly.
4. Press the **Func** knob.
5. Press the **Confrm** knob to delete the custom control.

SideShot Custom Control Shot Box

The SideShot connects to the switcher and provides quick access to all 24 custom controls on each custom control bank. Refer to the instructions that came with SideShot for setup information.

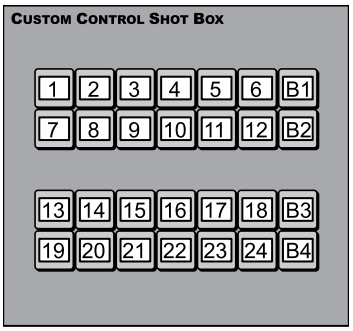


Figure 15: SideShot Button Mapping

The four buttons on the right side of the module select the active custom control bank, and the remaining buttons trigger the custom control on the bank. The mnemonic for the custom control is inverted if the custom control is running.

Switcher Soft Reset

If required, the switcher can be reset to return it to a user-defined default setting, or the factory default state. A reset can be performed the entire switcher, or individual components, such as keys.

Soft Reset

The software reset returns the switcher to the default state. Black is selected on all buses, all keys are cut off-air, and the transition rate is set back to default. This is useful if you need to return the switcher to a known state.

To Reset the Switcher Software

1. Press and hold **MENU**.
2. Press **Reset All** (**RESET** on the Carbonite 1).

Custom Reset Settings

You can customize many of the default switcher parameters and save them as a user-defined reset settings. These custom reset settings can then be recalled when you want to return the switcher to a previous state.

To Save a Custom Reset Setting

You can customize many of the default switcher parameters and save them as a user-defined custom reset.

1. Press **MENU** > **RESET** > **NEXT**.
2. Use the **Attrib** knob to select **Media**.
3. Use the **Media** knob to select **Media1**.
4. Use the **Value** knob to select whether the Media-Store channel is reset with a switcher reset or not.
   - **NoRst** — the Media-Store channel is not reset
   - **Reset** — the Media-Store channel is reset with a switcher reset

   Repeat this for the remaining Media-Store channels.
5. Use the **Attrib** knob to select **Aux**.
6. Use the **Aux** knob to select **Aux 1**.
7. Use the **Value** knob to select whether the Aux bus is reset with a switcher reset or not.
   - **NoRst** — the Aux bus is not reset
   - **Reset** — the Aux bus is reset with a switcher reset

   Repeat this for the remaining Aux buses.
8. Press **NEXT** > **NEXT** > **NEXT**.
9. Press **RState Save**.
10. Press **Confrm** to save the new reset settings.

To Load a Custom Reset Setting

1. Press **MENU RESET**.
2. Press **RState Load**.

   You can also press and hold **MENU** and press **Reset All** (**RESET** on the Carbonite 1).

Factory Default Settings

You can restore the switcher to the factory default state. All installation and personality settings are reset.

To Factory Reset the Switcher

1. Press **MENU** > **RESET** > **NEXT** > **NEXT**.
2. Press the **Factry Reset** knob.
3. Press the **Confrm** knob to load the factory default settings.

Resetting Individual Components

You can reset only the component that you want, instead of the entire switcher. Individual MLEs, keys, aux buses, dissolves, wipes, and menu items can be reset.

Table 7: Resetting Individual Components

To Reset	Buttons to Press	Result
Wipes	**WIPE** and **RESET**	all wipe parameters, including position, pattern, and border, are reset
Dissolves	**DISS** and **RESET**	all dissolve parameters are reset
Keys	**KEY # SEL** and **RESET**	key parameters for key # including clip, gain, and mask, are reset, but not key type, or chroma key color selection (each keyer is reset individually) (# is the number of the key)
MLEs	**MLE #** and **RESET** (C1 only)	MLE # parameters, including source selections, are reset (each MLE is reset individually) (# is the number of the MLE)
	MLE # STORE and **MLE # RECALL** (all other panels)	
Aux Buses	**AUX #** and **RESET**	Aux bus # parameters, including source selections, are reset (each Aux is reset individually) (# is the number of the aux bus)
Menu Items	double-press the knob for the value you want to reset	the value for that knob is reset

Glossary of Terms

Auto Key
A pairing of two video signals, a key video and a key alpha, to create a key. In the switcher, you associate the fill and alpha so that the switcher knows which alpha to use when the video is selected.

Auto Transition
An automatic transition in which the manual movement of the fader handle is simulated electronically. The transition starts when the **AUTO TRANS** button is pressed and takes place over a pre-selected time period, measured in frames.

Chroma Key
Chroma Key is a key in which the hole is cut based on a color value, or hue, rather than a luminance value or alpha signal. The color is removed and replaced with background video from another source.

Cut
An instantaneous switch from one video signal to another.

Dissolve
A transition from one video signal to another in which one signal is faded down, while the other is simultaneously faded up. The terms mix or cross-fade are often used interchangeably with dissolve.

Dynamic Host Configuration Protocol (DHCP)
An Ethernet protocol where a device, such as the switcher, is given an IP address by the network host. This eliminates the need to manually enter the network parameters and IP address.

Field
One half of a complete picture (or frame) interval containing all of the odd, or all of the even, lines in interlaced scanning. One scan of a TV screen is called a field; two fields are required to make a complete picture (which is a frame).

Frame
One complete picture consisting of two fields of interlaced scanning lines.

FTP
An abbreviation for File Transfer Protocol that is used to transfer files from one computer to another over a TCP-IP connection, like the internet.

GPI
An abbreviation for General Purpose Interface, a simple high/low signal that is used to trigger an action either on an external device or on the switcher. A GPI can be an input or an output to the switcher.

HD
A high definition (720p or 1080i) video signal.

Hue
The characteristic of a color signal that determines whether the color is red, yellow, green, blue, purple, etc. (the three characteristics of a TV color signal are chrominance, luminance, and hue). White, black, and gray are not considered hues.

Key
An effect produced by cutting a hole in the background video, then filling the hole with video or matte from another source. Key source video cuts the hole, key fill video fills the hole. The video signal used for cut and fill can come from the same, or separate, sources.

Key Video
A video input which is timed to fill the hole provided by the key source video. An example of key video is the video output of a character generator.

Key Invert
An effect that reverses the polarity of the key source so that the holes in the background are cut by dark areas of the key source instead of bright areas.

Key Mask
A keying technique in which a pattern is combined with the key source to block out unwanted portions of the key source.

Key Alpha
The video signal which cuts a hole in the background video to make a key effect possible. Also called Key Video or Source. In practice, this signal controls when a video mixer circuit will switch from background to key fill video.

Linear Keys
Linear keys make it possible to fully specify the transparency of a key from opaque, through transparent, to fully off. The transparency is specified by the key alpha that is associated with the key video. A keyer capable of a linear key converts the key signal voltage directly to the transparency effect on the screen.

Mnemonics
A green, orange, or yellow display used to show the names of a source above or below the source button or used as a custom command or pattern button.

Pre-Delay
A pre-delay is a delay that is inserted into a transition between the triggering of a GPI output and performing the transition. The length of the pre-delay is usually the length of time your video server requires to start playing a clip or your character generator required to load a page.

RossTalk
An ethernet based protocol that allows allow the control over Ross devices using plain english commands.

SD
A standard definition (480i or 576i) video signal.

Self Key
A key effect in which the same video signal serves as both the key signal and key fill.

Shaped
An additive key where the Key Alpha cuts a hole based on the monochrome value of the alpha. Shades of gray

are translated into either white or black, giving the key a hard edge. Shaped Key alphas are sometimes used with Character Generators to cut very precise holes for the fill.

Tally

An indicator which illuminates when the associated button, or control, is selected or is on-air.

Unshaped

A multiplicative key where the Key Alpha cuts a hole based on the gradient values of the alpha. Shades of gray are translated into transparency levels, giving the key a soft edge. Unshaped Key alphas can also be considered true linear alphas. Key alphas are set to unshaped by default.

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